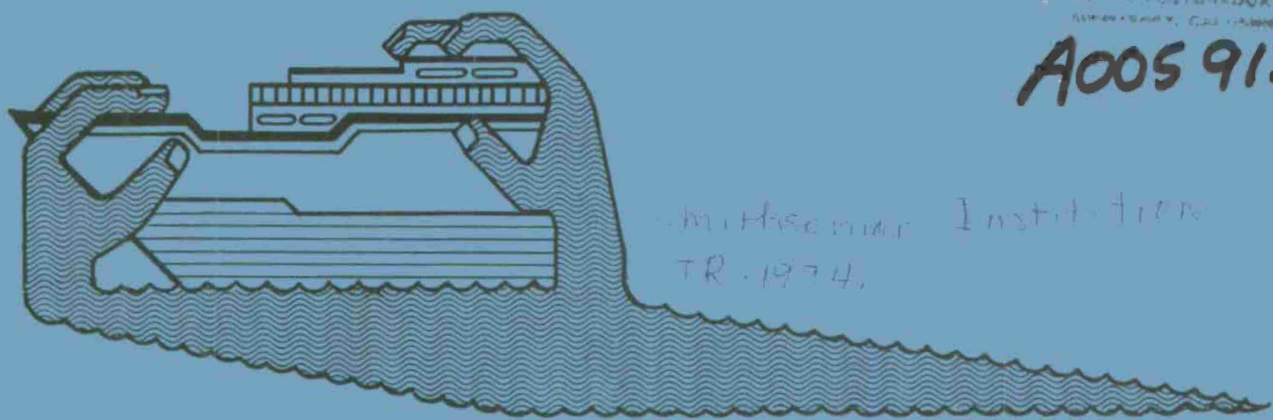


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Smithsonian Institution  
TR-1974

# SHIPshaping

a seminar in los angeles california 23-24 may 74

MANAGEMENT OF THE SHIP ENVIRONMENT  
TO IMPROVE NAVY EFFECTIVENESS  
IN THE FUTURE

DESIGN MANAGEMENT RESOURCES GROUP

Daniel, Mann, Johnson, & Mendenhall  
Social Engineering Technology  
Perry Tiller Associates

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The first part of the paper discusses the importance of the study and the objectives of the research. It highlights the need for a comprehensive understanding of the subject matter and the role of the researcher in this process. The second part of the paper presents the methodology used in the study, including the data collection methods and the analysis techniques. The third part of the paper discusses the results of the study and the conclusions drawn from the data. The final part of the paper provides a summary of the findings and offers suggestions for future research.

# SHIPshaping

report prepared by  
D Sam Scheele  
George Rand  
Charlton R Price

an interpretive summary of a seminar on  
management of the ship environment to  
improve navy effectiveness in the future

July 1, 1974

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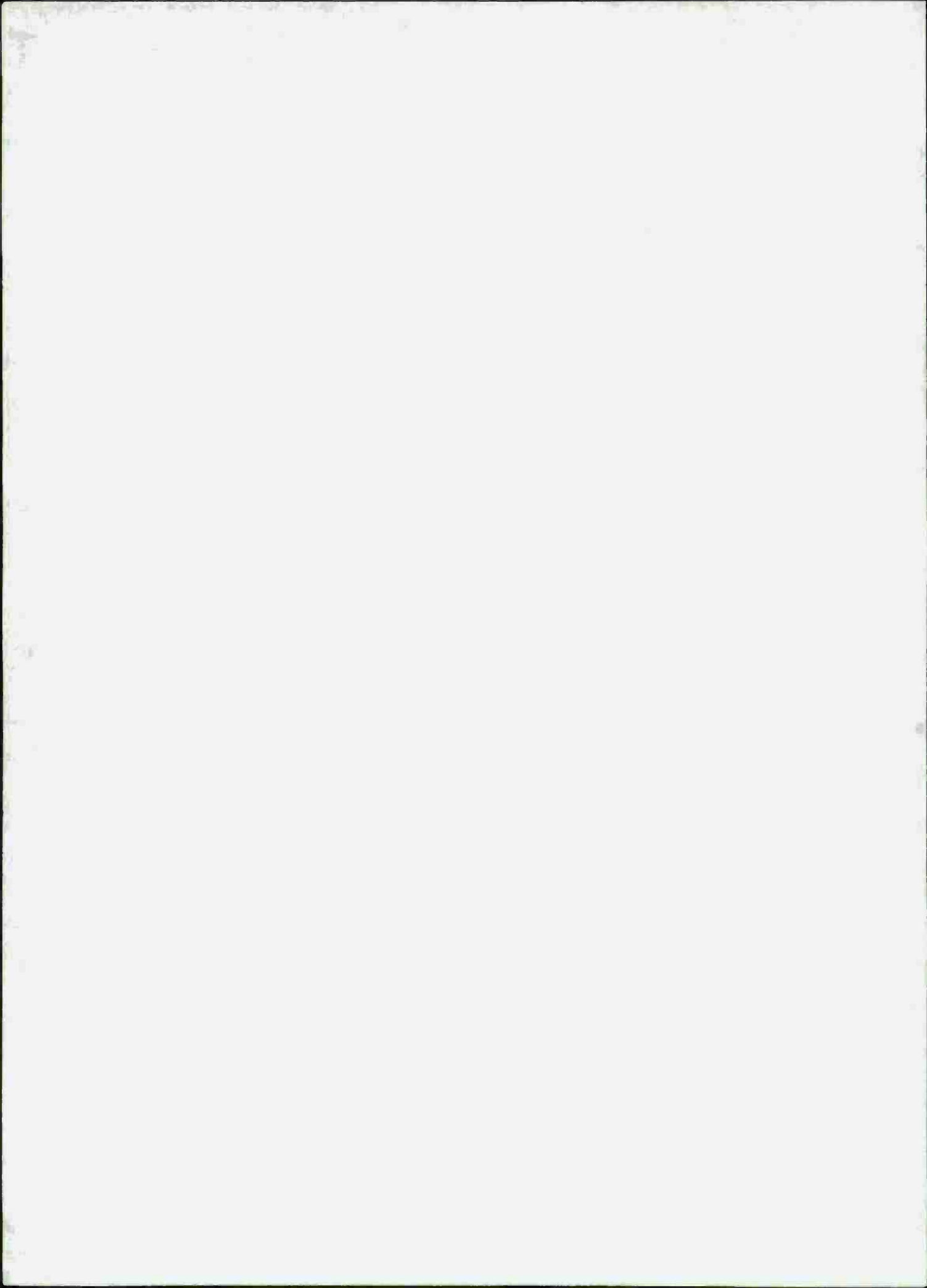
#### W A R N I N G

The reader should not expect this publication to present a sequential and well-formed discussion of the topic. The material is discursive. It is an interpretive summary of a seminar. In many ways it is redundant. Many ideas are stated and never followed up and points raised without being dealt with. Whole theories are implicitly brought into the discussion by a word or phrase—without explanation. This document is first notes to the topic for those who were there. Second, it's a lively introduction to the topic for those who might have liked to be there. Third, it points out some serious and challenging issues for consideration in the future.

#### W A R N I N G



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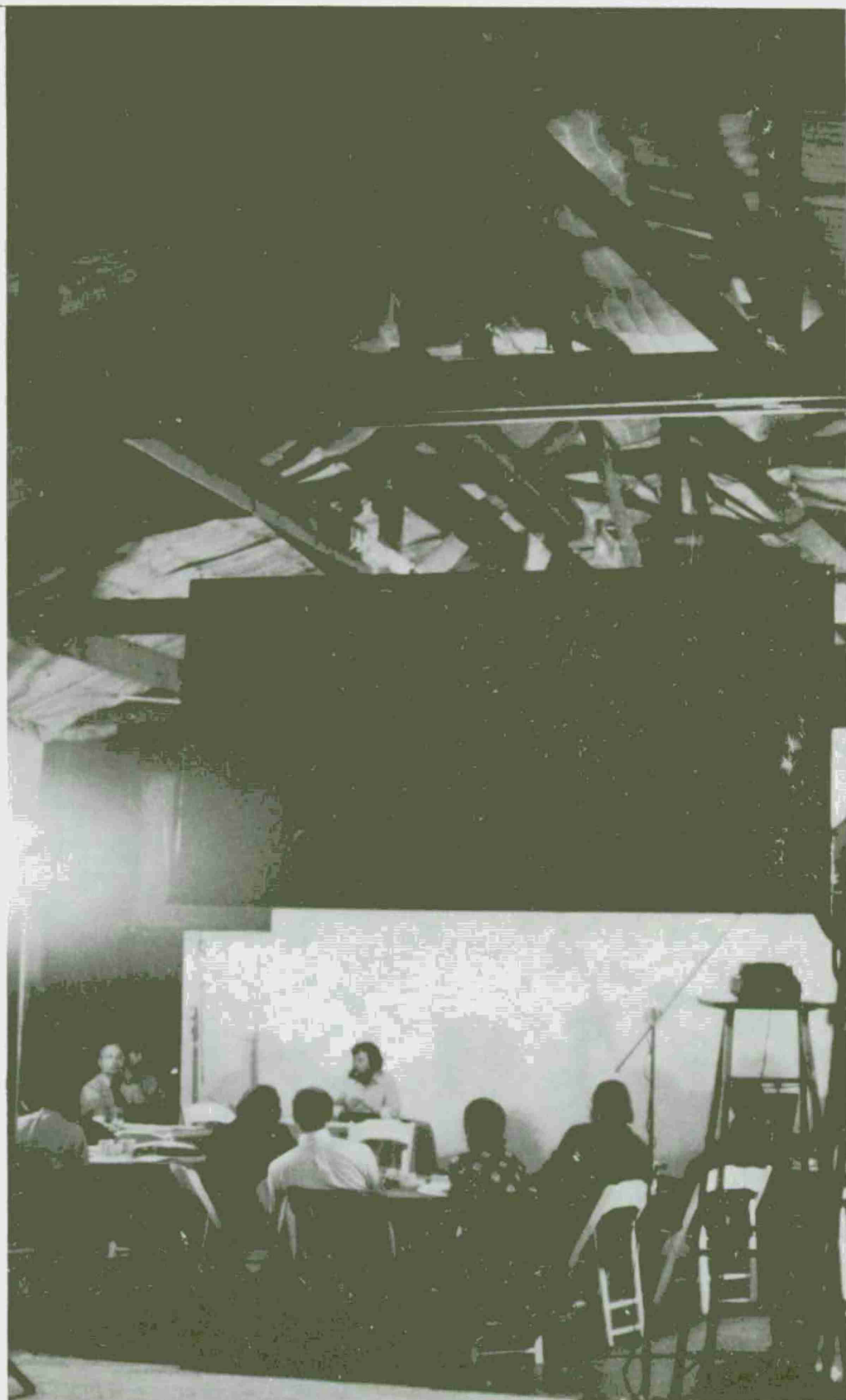
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"Explain all that," said the Mock Turtle.  
"No, no! The adventures first," said the  
Gryphon in an impatient tone: "Explanations take such a dreadful time."

LEWIS CARROLL

## OVERVIEW

This document is intended to frame the beginning of a new practice--environmental management. Particular emphasis is directed to discovering how environmental management can be applied to the improvement of naval ships. The meanings of "improvement" in naval ships are as diverse as the personnel who manage them: ship designers, systems researchers, policy planners, line commanders, staff specialists . . . each has profession-based attitudes about what constitutes improvement. There are also wide variations in style--from hard-line traditionalists to soft-hearted apologists. Being a unique developmental approach, environmental management can be expected to yield increasingly valuable results as the practice takes shape and wins acceptance.

Introducing environmental management means engendering a process in which a great variety of aspirations for the future Navy are articulated. It means improving the organizational performance and environmental quality of present Navy ships as a way of discovering how future naval ships should be designed and managed. Ultimately, ships cannot be designed or even adequately understood by anyone outside the Navy or who lacks intimate familiarity with seafaring as a way of life. But the "outsider" can act as a catalyst. He can usefully put together interests and concerns from professional Navy groups who through narrow specialization may lack a basis for collaboration with other important contributors to the design, management and operation of the Navy. This is a beginning.

What the Navy is, how it explains itself to itself in its daily actions, is different than how it's explained by anyone trying to tell about it.

We should live for the future, and yet should find our life in the fidelities of the present. The last is only the method of the first.

HENRY WARD BEECHER

### A Jumping Off Point

Question:

What does a sailor do when he's not on duty?

Answer:

Lie in a bunk, eat, and sleep.

Inquiry:

Is this what's happening?

We asked for sea stories--experiences, exactly what happened. We got a few, but not nearly enough. Most of the detailed accounts of everyday life aboard ship are still to be collected. What is known about everyday shipboard life is framed in the meanings and explanations which have become normal to the Navy. We seek fresh explanations to normalize change, to make recognized and agreed upon improvements in the social and physical environment of Navy ships--including the meanings of these ships to those who man them--a normal part of Navy experience. We have lots of explanation. We hope some adventure too.

### What Occurred



A two day seminar on environmental management was held in Los Angeles on May 23 and 24, 1974. Invitees were carefully selected to represent a wide range of interests and background in the Navy. Despite the risk of not being able to match the desire of line commanders for hard and immediate answers, it was important to invite them to represent their operating milieu. It was also important to accept the risk of inviting different specialists, each with his own agenda, who aren't accustomed to conferring and collaborating with one another. It would have been easier to convene a seminar restricted to researchers, designers, or commanders alone. Such a meeting would likely produce clear recommendations for action. But such recommendations would simply represent the improvements agreed to be important from a single point of view. We wanted wider "sales" appeal.



Finally, the conference was put together very quickly, being scheduled to take advantage of the availability of key personnel. As a result, there were many people who could have made significant contributions who were not able to attend owing to prior commitments or administrative circumstances. Despite the lack of complete representation, a remarkably diverse group attended. And, by the end of the seminar, the group had forged a partially shared picture of what environmental management might do for the Navy.

The first day of the seminar was held in a film production studio in Hollywood. The functional appropriateness of the stage-set and lighting to their ordinary work was transferred by the appurtenances of a conference--tables, seating, orange tablecloths, podium, projection screen, and gumbo lunch--into a plausible and believable seminar setting. Regular seminar behavior ensued. Employing a studio in this fashion was meant to underline the range of choices one has in picking a suitable setting, and the diversity of meanings of the concept, like a seminar can be made to have through design of its presentation of itself--the behavioral and physical symbols and gestures that serve as clues to "what it is that's going on."

The meaning of environments is constructed.

The second day the seminar was convened in a very different environment--a Methodist retreat house in Pacific Palisades. The small scale, soft-cushioned reflective atmosphere provided a striking contrast with the expansiveness of the film studio. The setting, as well as the passage of time together, seemed to induce much more free-flowing and speculative discussion. Although there were several drop-outs, withdrawals, or persons otherwise lost due to poor geographical directions, the sessions were convivial, serious, and straightforward. Participants showed no reluctance to speak

their minds or to yell "boondoggle" when it seemed appropriate. This frank and candid character of the conference will become evident in reading this interpretive summary.

### What to Expect

This is not a direct transcript of all the conversations that took place during the conference. Rather it is an effort to represent the living character of the conference. It coalesces key insights and concepts as well as including the ambiguities and confusions. It is an attempt to let the reader in on the process of reasoning about environmental management. It is not fair to, or collaborative with, the reader to just present conclusions. Yet no one wishes to read all the discussion and debate. So we try to summarize the proceedings in the most interesting manner possible. The result we hope can be read with some feeling about the interaction through which the thoughts unfolded and were shaped.

Sometimes there will be notes, phrases, slogans, or diagrams in the margin to provide interest and marks in the textual territory.

One never knows who will read a document like this, what will occur to them as they read, or the meaning it will have for readers in their lives and work. Sometimes a document can be used to give emphasis to an already widely accepted and well understood point of view. Particularly in instances where there simply isn't anything to "hold up" to represent a pervasively acted upon common-sense approach. Hopefully, this is one way this document will have an effect. It is not rich with data. It has a point of view but lacks concrete hypotheses. But for those who have a long-range interest in articulating an environmental management approach, it may prove to be a good tool for their identification of opportunities for application and in thinking about designs for important empirical research. Through a continuing discussion we would hope to see environmental management:

- (1) emerge as a new field of practice;
- (2) attract opportunities for the application of its approach;
- (3) develop a new "lore" based on experiences not previously logged by other professionals;
- (4) create guiding rules-of-thumb based on environmental management experience; and
- (5) produce practitioners for this approach drawn from many different disciplines and backgrounds.

### Patterns of a New Practice

From the seminar several features that should characterize the practice of environmental management could be identified.

These included:

- CONGRUENCE OF MANAGEMENT & IMPROVEMENT

Practitioners will function as special managers for a limited period and with a limited scope in situations selected for improvement with responsibility for both introducing change and continued functioning.

- LOCALLY INITIATED ACTIONS

All personnel will have some training in identifying opportunities for improvement of the social and physical environment and additionally in taking ad hoc, serendipitous actions to discover what provided with access to special assistance to make their ideas suitable for action.

- UNIQUENESS OF EACH SHIP AND SETTING

Efforts to implement improvements in the social and physical environments of ships should recognize and make use of the unique properties of each ship and setting.

- COLLECTION AND SHARING OF REFLECTED ON EXPERIENCE

A mechanism for the regular collection of the experiences of both officer and enlisted personnel with introducing improvements in the social and physical

environments of ships will be established along with the creation of an information resource to be used in providing technical assistance.

- NO CREATION OF A NEW STAFF SPECIALTY

Instead of organizing a staff of specialists in environmental management it is suggested that personnel be detailed to environmental management duties for limited periods of time to provide special assistance to management on ships seeking help in introducing environmental improvements (similar to detailing of staff to the Fleet Training Group).

- UNDERTAKING OF STUDIES TO EXPLORE THE CREATION OF MEANING FOR SHIP ENVIRONMENTS

The Navy should create an interorganizational basis for supporting research, design, and demonstration projects that would increase the knowledge about how meanings for ship environments are sustained and revised which would be available for application.

## BACKGROUND

It is no simple matter to pause in the midst of one's maturity, when life is full of function, to examine what are the principles which control that functioning.

PEARL SYDENSTRICKER BUCK

Holding a conference-workshop on Management of the Ship Environment to Improve Navy Effectiveness in the Future seemed to be a good first step in relating the features of the social and physical environment to organizational effectiveness. This seminar was held on 23 and 24 May 1974 in Los Angeles. The seminar suggested the context, discussed project possibilities, and developed strategies for assembling a program to introduce the field of environmental management to the Navy. Participants at the conference included naval architects, people from various sections of personnel research, mental health specialists, sociologists from academic institutions, and line officers with recent ships command assignments, as well as members of the Environmental Resource Management Team.

### About the Title and the Topic

SHIPshaping seemed an appealing label for an activity we expect to become an ordinary, everyday, routine part of Naval ship functioning. Ship is the environment which is the target of attention. Shaping suggests a design approach to the iterative modification of the environment based on practical experience. Shipshaping in its vernacular meaning would suggest the making of incremental and additive improvements to a functioning system based primarily on better use of the resources at hand: a shaping up of the ship to make it shipshape make it shipshape. We selected the gerund form to place emphasis on the process--the doing of the activity--from selection of what to improve through actions to evaluation. Enough of definition.

## SHIPshaping





It seemed too many of the attempts at introducing positive change have relied on special wisdom, techniques, systems, or procedures which largely depend on the initiative and resourcefulness of experts and which are perpetually dependent on them for continuous adaption to the evolving operational scene. Using SHIPshaping as a title for the practices of environmental management, conveys more of an expanded common-sense approach than would be available to and employed by those directly involved in the management and operation of ships to effect environmental improvements.

The concept of environmental management resulted from discussions among staff members of Social Engineering Technology; Daniel, Mann, Johnson & Mendenhall; and Perry Tiller Associates about ways to improve the environment aboard Naval ships. These discussions were prompted by contacts with the Ship Arrangements Branch, Naval Ship Engineering Center (NAVSEC). Articles by Daniel E. Weiler and Joseph E. Castle (The Need for an Open Systems Approach to Naval Ship Habitability Design, Transactions-The Society of Naval Architects and Marine Engineers, Vol. 80, 1972) and Michael H. Heffron (The Naval Ship as an Urban Design Problem, Naval Engineers Journal, April 1973) set forth some design objectives. They identified the needs to:

- View naval ships as socio-technical systems that make it possible to consider trade-offs between not only personnel needs and technical means, but mission requirements.
- Break out of cyclical pattern of complaints-concern-improvements-neglect with respect to habitability which has become a pattern in the Navy and develop an approach that involves continuing attention to the ship environment.
- Transition from the closed-systems approach of the past to an open-system design process for future ships.

There is nothing more practical than  
a good theory.

KURT LEWIN

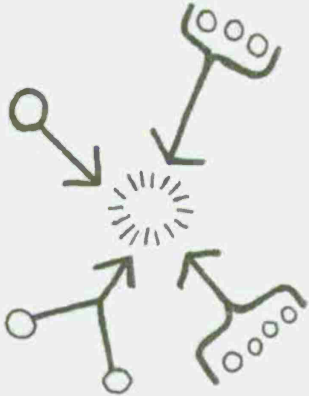
- See the importance of environment research and criteria development in producing the information to support the improvement of ship environments.
- Give attention to segregation of functions and differentiation of spaces to improve livability of ships.
- See that improvements of the ship environment are justified by reduction in turnover-training costs and increases in personnel productivity as well as by decreased expenditures for maintenance.
- Approach conceptually naval ship design as an urban design and planning problem to produce improved environments rather than add more engineering specialists to continue the traditions of naval architecture.
- Give explicit recognition to characteristics of the sea environment--corrosive salt water, humidity, wave motion, wind, heat and cold, and vastness.
- Seriously address the task of developing an overall concept of what life at sea should be in the future.
- Create viable neighborhoods aboard ships to serve as a basis for integrated community life and containing vested services provided to the whole ship.

The Conference also noted these features of the shipboard environment:

- The organization of naval ships has created three relatively unambiguous classes--the Officers, the Chief Petty Officers, and the Crew--who to a great extent have segregated lives.
- Personnel Services aboard ship vary extensively with the type of ship and on each ship among the three classes of personnel with most services minimally adequate and largely tolerated by tradition.
- The naval ship is like a company town with the overriding features being the concerns of the service, fixed status, largely instrumental interaction, and lack of choice with authoritarian control of personal services.
- The environment of a naval ship is characterized by machine like qualities--drab colors, noises, vibrations, motions, odors, temperatures, function.
- The "ghettoization" of the ship into class and functionally defined territories that raise barriers to effective interaction and mutual understanding, create sources of discontent and potential rebellion, and are in general repugnant to the nation's ideals and concept of social progress.

### What We Thought We Were Doing

We conceived this seminar as a way of calling into existence a needed new field. When you try to define a new field, everyone who arrives on the scene is going to have their own claims upon its future. They obtain their legitimacy and sense of practical value from their specialized skills as researchers, or managers, or engineers, or designers . . . Many people in the design profession, especially those involved with the design of educational facilities, health-care complexes, and correctional institutions have had this experience of trying to introduce innovations where diverse professional specialists persist in wishing to replicate what they are most familiar with and know the best. The unstated proposition is "How I was trained or what I know is the way it should be." To circumvent the conservatism produced by the involved professionals' need to make recommendations and their frequent lack of concrete experience with diverse alternatives, many firms and agencies have tried to follow a design-by-team approach. This approach attempts to integrate the specialized inputs from different kinds of experts through intragroup review and negotiation. This is often a disappointing process. Professional status and domains of control dominate the design team's interaction and one ends up with a camel-like plan designed by a committee.



It seems to us that the only place to obtain the kind of knowledge and techniques required to perform integrative design tasks is from the work of designing itself, that is, to learn how by doing the designing of concrete procedures or specific features. In time one accumulates the kind of clinical experience that is needed--that which blends together a variety of competences. From this, clinical practitioners can be devel-



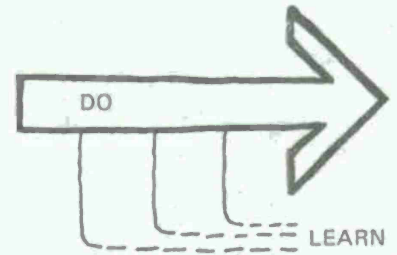
oped who, like physicians, can go to a novel situation and pretty well diagnose ailments and make recommendations for action. This research-in-action approach means undertaking action as experiments to produce a kind of clinical wisdom or "lore" from which to be able to make the effective recommendations. The management personnel presently commanding ships are not really designers, but they may be innovators, if given the opportunity.

In some respects, science has moved quickly from its natural history phase into dealing with clearly defined variables in highly controlled laboratory-like settings. By collecting "lore" we really mean returning to the security of common-sense analyses of the problems of shipboard life by those people who know the ship intimately as an ordinary, everyday, mundane setting--a practical place. It takes some effort at seeing freshly to be able to notice as occurrences those things which are so much a part of a situation as to be presumed as definitional contextual descriptors and not seen as independent design variables. Environments as subjects for research-in-action efforts, almost by definition, conceal potential design variables. Without the bedrock of common-sense, science isn't worth very much.

#### How This Seminar Came About

Through discussion we learned NAVSEC was directly concerned with ship design and that our interest in the management of ship environments was broader than their mandate. They suggested that the Office of Naval Research's Organizational Effectiveness Program be approached to support a conference.

This program area has a continuing research interest in topics which include: the organization, its setting, and its personnel. A conference or seminar would provide a common spatial and temporal point to bring together a variety of practitioners and scholars who are concerned with more effective environmental design. A rationale for a conference-workshop was prepared and ONR agreed to partially sponsor what we now



If there's no logical, evident, unquestioned place to start, you hold a conference.

refer to as the seminar--it was more learning than telling. It still is and promises to continue that way for some time.

ONR also helped involve individuals with line command experience in the Navy and suggested applied researchers who had related concerns. This resulted in the invitation of those with an interest in improving design, those involved in improving command, and those concerned with understanding human behavior.

The seminar served as an occasion to get people together who have employed different approaches to the related problems of man-made environments, the society that gives rise to them, and the organizations that inhabit them. The Naval ship reflects in microcosm many of the same issues that thwart organizational effectiveness in larger institutions. Prior socio-physical studies of mental institutions and school systems have yielded interesting results and set the stage for dealing with a more function-oriented and socially competent organizations. Though very complex, the design of socio-physical improvements to increase the effectiveness of Naval ships is still less difficult than designing improvements for urban settlements. Thus it was hoped that Naval ships could serve as a focus for the variety of professional and academic disciplines that are concerned with improving the performance of social and physical environments in an urban society.

That we have a concept of organizational effectiveness implies that a designated organization not only knows what it is supposed to do and has the capabilities to do it, but also that it is composed of individuals who share enough understanding of their mutual relationships and collective functioning to be able to act on them. The roles of personnel training, job experience, operating procedures, effective communications, and electronic systems, as well as personal qualities, leadership traits, management style . . . have an accepted role in improving the effectiveness of organizations. However, environmental management does not. This seminar was conceived as a means to get a variety of people together to develop clearer hypotheses about:

- which issues or needs might provide occasions for undertaking environmental management projects;
- what kinds of information might prove necessary or useful in pursuing environmental management programs;
- which settings or situations aboard ship have the greatest potential for precipitating far reaching improvements (an epidemic of improvements);
- how environmental management practices might be made a regular part of Naval activities;
- what measures might be used to evaluate effectiveness of environmental management results.



THIS ITEM IS THE  
MOST IMPORTANT  
AND  
PROBABLY THE HARDEST

### Planning for People and Things

One of the reasons for holding this seminar was to look at ways for improving the design of ships and thereby increase the effectiveness of ships both as military environments and as peacetime settlements. There appears to be a major obstacle to integrative design of ships. This stems from the tradition that planning for personnel utilization and organizational structures proceeds almost entirely separately from the planning of arrangements and systems of the ship's physical structure.

In preparing the seminar and this resulting document we tried to look past the arbitrary division of tasks related to ship design within the institutional structure of the Navy. In fact, we began to frame a new discipline which would cut across prevailing distinctions between technical and engineering programs for military and habitation systems and previously unrelated programs involving training, personnel management, organizational development, drug and alcohol abuse prevention, mental health . . . The needed new integrative discipline would not be another speciality--but a new competence for line commanders, plus a way of packaging information from many specialties to make it available as occasions for use are manifested in the operating environment. Subsequently learning from the ship's operating environment could be incorporated in the designs for new ships.

## Organizing Principles for the Seminar and the Documentation --Sometimes Followed

The organization of this interpretative summary is roughly based on the conceptual outline for the meeting. A copy of the agenda is reproduced on the opposite page. It was our intention to work on what might be done in the future and not dwell primarily on relating what has been done in the past and how it has worked.

This report of the seminar has two objectives:

- (1) to serve as a record of what went on, what concepts were suggested, what ideas developed, and
- (2) to provide a resource for further work on common issues, by the various kinds of people who attended.

The first part of the seminar was concerned with the organization of the field of Environmental Management. Each participant described how they saw the field in relation to their own work. They also related what they felt was important but probably wouldn't be covered in the seminar. The section that follows discusses the implicit concepts about how things get done that were evident at the seminar. This is followed by a section about how "oral history" might be utilized to improve what is done.

Next the changing context of the Navy in the future was described. Different alternatives which exist now to define what the situation is were suggested to demonstrate how the situation is viewed might be altered. How the situation is seen--the reality that prevails--shapes that we consider to be appropriate things to do.

There are several aspects of the Navy context which deserve special attention:

first, the costs for the personnel who staff the Navy are more than 60 percent of its total budget;

second, the missions that the Navy expects to undertake in the future depend on the types of people

It used to be that efforts were documented; now, we hope, documentation will beget efforts.



## AGENDA

## MANAGEMENT OF THE SHIP ENVIRONMENT TO IMPROVE NAVY EFFECTIVENESS IN THE FUTURE

Each participant has had experience in trying to change the social and physical environment to improve an organization's functioning and survival. Our intent here is not to dwell on what has been done, but to call on what we've each learned from what we've done to pick better what to try next.

### CONTEXT CREATING

#### elements:

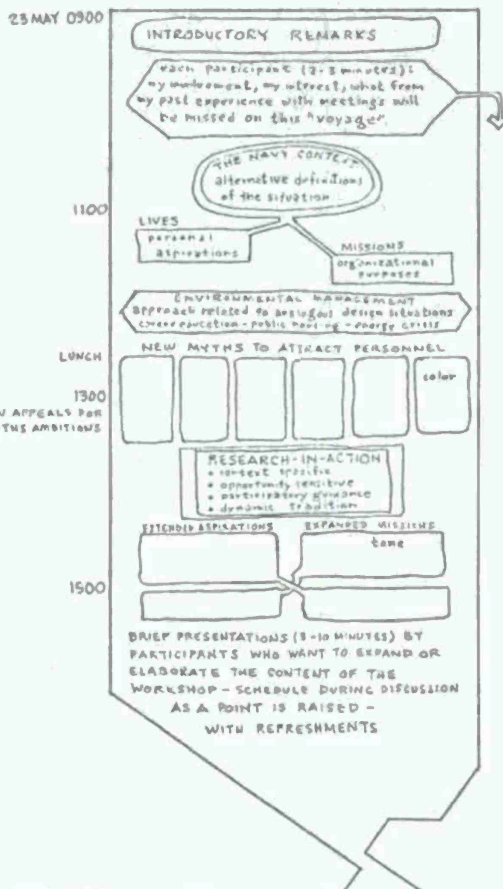
higher education levels and aspirations  
negative personnel selectivity  
life style differentiation  
sex and familial relationship preferences  
reserve integration and augmentation  
higher training costs  
greater interest in personal development  
broadly representative military  
multi-functional utilization of military capacities

#### Lives

personal interest-identity development  
cross-cultural experiences  
self initiated activities and adventures

#### Missions

development of new sea-based technologies  
aquaculture experiments and demonstrations  
supervision of mining and manufacturing at sea  
technical assistance abroad



### PROJECT CONSTRUCTION

#### elements:

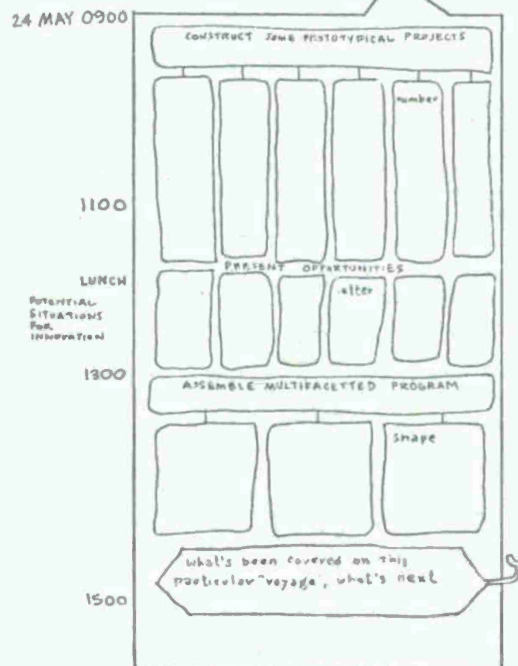
training programs and activities  
showing leave  
job redesign and role elaboration  
educational offerings  
vocational interests  
work assignment processes  
trial experiences with vocational alternatives  
career ladders  
crew initiated recruitment  
participation in assessment-evaluation  
conferencing to augment communications  
regular maintenance activities  
changes of shifts  
personnel multiplexing  
simplification of reports and regulations  
reallocation of space to activity pattern combinations  
integrated and accessible planning and budgeting

### PROGRAM ASSEMBLY

#### elements:

identification of innovator ships  
creation of secure school doctrine  
capturing of 1000  
democratic of time periods  
consideration of new budgetary trade-offs  
marital audit  
recognition of accomplishments  
reward and incentive programs for groups  
targeting recruiting appeals for particular segments

aircraft carriers  
cruisers  
destroyers  
 amphibious assault ships  
 patrol craft  
 minesweepers  
 service ships  
 submarines



that can be recruited into the Navy--how the Navy uses them will likely undergo some rather major changes, based on the fact that personal aspirations are growing and changing;

third, the kinds of organizational purposes to which the Navy's capabilities can be directed will also be undergoing redefinition in the larger political context, not only within the U.S. , but in the world of particular importance, obviously, will be the fact that there are presently no jurisdictional boundaries drawn on the sea; as the sea becomes a more important resource, a more important setting for economic activities, these jurisdictions will have to be created, leading to radical changes in the conception of the sea, its activities and protocols.

The section that follows points up the disparate views of what is and isn't "properly" a part of the concept of ship habitability in the views of different participants. Next, the possibilities for creating a new, widely shared view of what the Navy is about are discussed. This is followed by two sections which discuss the two principal contributors to a new Navy: new missions and new shipboard life. Next, the organizational and institutional problems in bringing about change are discussed. This material was largely taken from the discussions of the first day.

The second day the participants' attention was directed to the issues of how to create actionable projects and how to assemble an effective program of environmental management. From discussions about project construction, four other sections were created to describe the search for open space, the vicious cycle of organizations, and the contrast between process design and design-by-objectives, and a model for research in action. Finally, following the discussion of program assembly, some next steps that might be undertaken are suggested, including how missions might be expanded to make possible a more effective organization.

To summarize, the first day was devoted to describing the context in which the Navy will be operating in the future, the kinds of concerns that the Navy is going to have from management-command and mission-accomplishment point of view. The second day was devoted to what to do in response to these needs and concerns. This had two parts: the first which took the morning of the second day, was to define specific projects which could begin to make interventions in the environmental management arrangements on ship.

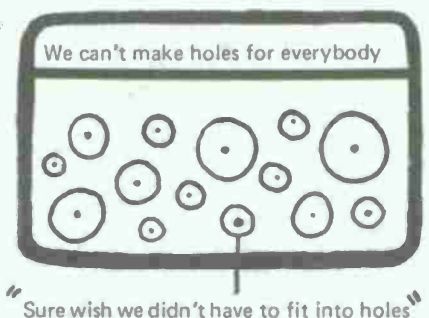
In the second half of the day, consideration was given to what other resources, facilities, organizations and groups within the Navy whose purposes might usefully be related to environmental management. The conferees speculated on how they could be involved in the ongoing process of environmental improvement aboard ship. Continuously the group probed for Navy situations with potential for innovation: what are specific places on board ship where one might best begin to introduce improvements.

The differences between the agenda for the workshop-conference and the organization and content of this interpretive summary of the seminar reflect the impact of what occurred on the Environmental Resources Management Team. The explanation of the seminar to orient the participants is reproduced below.

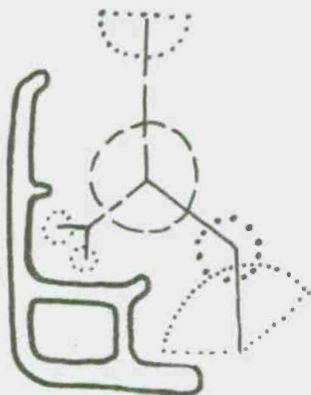
#### The Original Rationale for the Seminar

The present social and physical environment of most Navy ships is less than satisfactory from both the individual's and the organization's point of view. Developing a comprehensive list of perceived deficiencies and then simply correcting them would be enormously expensive--impossible in many instances--and would not be likely to significantly increase organizational effectiveness. There are many things wrong with the "ask-people-what-they-want-and-then-create-it" approach to the design of environments. People are seldom aware of the wide range of alternatives available, have difficulty assessing trade-offs without direct experience, make suggestions based on stereotypes selected from idealized expectations, are unable to relate their choices to the meaning and significance that will be given them by others, . . .

What this indicates is that there is little chance for making worthwhile improvements in the utilization of human resources







or the capacity for mission effectiveness in designs created by experts for anticipated situations that are not tested in the social and physical context of an operational ship. Present ships as environments for organizations and individuals contribute little to improved utilization of human resources or to the establishment and maintenance of mission effectiveness. In fact, present ship environments likely contribute in many ways to restricting personal development and lowering organizational performance. What is not needed is an industrial designer's remodeling of the quarters and facilities into a science-fiction fantasy setting accompanied by an efficiency expert's redesign of the crew's tasks and assignments into a marvel of integrated effectiveness. Exaggerated like this no one would authorize such a redesign. But, a variety of less grand and more reasonably cast versions are, no doubt, starting to compete for attention as problems of staffing and commanding ships are more evidenced by general difficulties and specific incidents. Both the functional and idealized approaches to environmental design will likely be ineffective in dealing with such problems as retaining skilled personnel, drug and alcohol abuse, sex integration of crews, and maintaining high levels of productivity during successive introductions of new technologies.

#### Round-and-Round and the Future

Oversimplified, schemes for a ship's physical arrangements reflect patterns recognized in its intended social arrangements, which in turn were partly necessitated by the customs of physical arrangements, which stemmed from traditions in social arrangements, and so forth. As new ships are contemplated for unprecedented missions and consideration is given to remodeling existing ships for new assignments, there is little experience on which to draw to begin to design appropriate physical and social arrangements that will improve the ship's performance in critical dimensions in the present and make it more responsive to future changes and contingencies. As the future becomes less predictable and societal change becomes the norm, it is important for the survival of an effective Navy to begin obtaining experience with the design of higher-performance physical and social arrangements for ships and shipboard life. Initially, important experience can be gained from relatively modest design efforts that are undertaken as research-in-action projects. In most cases already allocated funds can be used to effect these improvements. Gathering information about potentially better social and physical arrangements can interrupt the cycles of "organization determines facilities determines organization determines facilities . . ."

#### An Environmental Management Approach

What might be effective in redesigning a more responsive ship environment is both more subtle and more possible--an environmental management approach. This means looking at the ship as a socio-technical system and recognizing ships' crews as a major resource for improving the environment.

We want to know as much about the Navy as Gertrude Stein knew about the rose.



Using an environmental management approach, the ship arrangements are not first designed and then inhabited but both the physical features and social relationships are consciously and continuously adapted to create successive improvements. This leads to the consideration of a wide set of possible rearrangements which focus on command-relevant problems, rather than concentrating separately on the rearranging of particular subsystems that may or may not commensurately contribute to the ship's overall preparedness and combat effectiveness. We believe it is possible to use operational exercises and training missions as significant occasions for organizational development and the ships normal maintenance and furnishing functions as occasions for facilities development. The ability to affect the environment and the decision processes for determining environmental improvements can have major salutary effects on individuals and organizations independent of the qualities of the improvements themselves.

### A Modern View of the Environment

The shipboard environment acts as both context and symbol for the crew's operations (organizational) and the crew member's actions (individual). As a situational context the ship's environment embodies patterns which shape both functional and effective behavior of the crew. The meanings of the normal patterns for a particular ship can serve as a diagnostic device to surface both functioning and interpersonal problems. And, further, working on rearranging the patterns of physical features and social relationships can resolve these problems. Similarly, as a symbol system the ship's environment is replete with cues which supply meaning and significance for the crew's activities. Rearranging the symbolic physical and social structures and their meanings is a parallel approach to ferreting out significant operational problems and effecting improved solutions.

### Expected Results

Metaphorically, the environmental management approach uses the organizational and physical environment as a slate on which the past has been written and, more importantly, on which the future can be inscribed. The environment can serve as a common focus for improvement of a ship's operations from interactions between those who seek improved functioning and the crew, instead of interactions centering in arguments about what should work, why it doesn't, why it should, why it can't, why it's your fault, why do you want to do it . . . Using the environment as the target, both the crew and those who seek improved functioning work together on it--the environment. A further advantage is that improvements in organizational functioning will be vested or incorporated in the environment and therefore become a continuing part of a new "normal" way of doing or thinking about things.

Normal is negotiated.

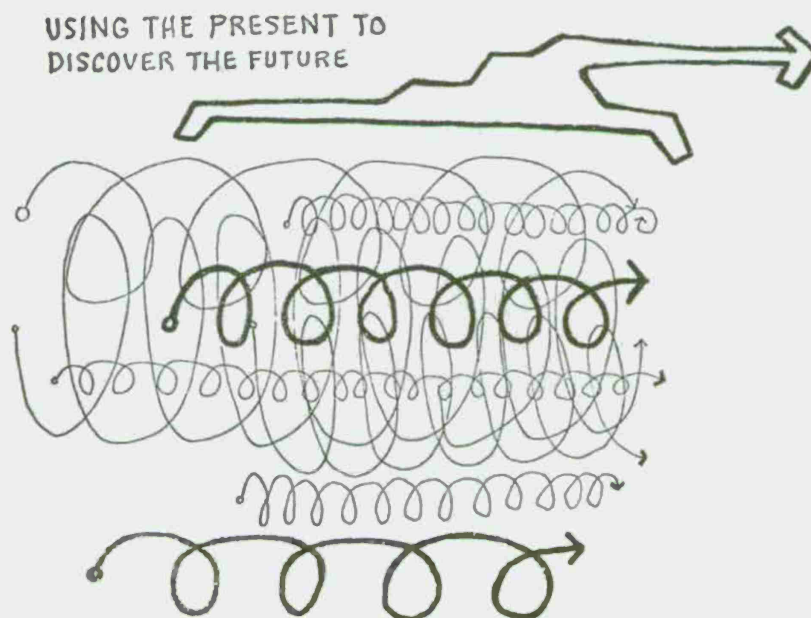
The environmental management approach to improved ship functioning is not a spruce-up, decorate, "soft" approach to making the ship more like "home." Rather the environmental

If you want to get something done—  
ask the busy man.

management approach is an effort to make shipboard life intrinsically more attractive and satisfying, as well as effective. This will likely mean adding additional activities and redividing responsibilities for and participation in present shipboard activities. As a succession of improvements to the environment are proposed by both the command and crew, evaluated by both, and the positive ones within cost constraints are adopted; the ship will become a uniquely suitable place that is believed to be responsive. Having established an adaptive environment and a systematic approach for introducing change, the ship as a socio-technical system will be more responsive to changes in the future.

### The Purpose of a Conference

Environmental management for ships is no one's specific responsibility now. Rather, the responsibility is diffused among many different Navy activities--and not a high priority in any. Also, the theoretical formulations and research results that would support an environmental management effort are scattered among many disciplines. Further, there is neither a clear-cut or well-defined methodological approach for organizing an environmental management project for a single ship, nor is there an institutionalized body of doctrine which would support the undertaking of environmental management projects to improve the operation of ships, identify which ships, and justify the levels of expenditures. This means starting to establish a new field of professional practice. We suggest beginning at the most concrete level--exploring what such a professional practice might be actually like in a project and then discuss how it might become a regular way of doing things in a large organization.



The practices of good men are more subject to error than their speculations. I will, then, honor good examples, but endeavor to live according to good precepts.

JOSEPH HALL

## MISSING AGENDAS

Discovering where someone came from is often evidenced by where they go. We all come to meetings with certain expectations, or rather, even hopes of things we'd like to have come up and to be dealt with by a group. Most of these hopes we take back home with us, having felt that while the meeting was good, it failed in part because these were not dealt with. Therefore, it's useful to start off working sessions by asking: "What are you afraid won't be covered that really deserves attention?" The kind of thing that when you return and are asked about the meetings you say, ". . . and as I expected they never got around to dealing with . . . ."

It is important to get these missing agenda items out so they can be dealt with if possible during the meeting. At least it's useful to get them out so that they can be noted in the record as topics for later discussion. Meetings should not always be looked on as means for deciding about or determining things. Rather, meetings can serve to bring up through interaction those things that need to be defined as important tasks for the group to work on together in the future. This section provides us a chance to identify the seminar participants and to catalog these latent agenda items.

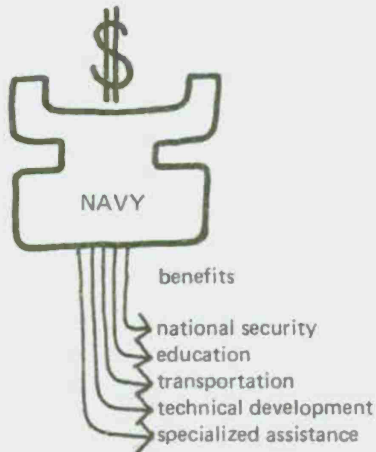
### What We Ought to Talk About Too

SAM SCHEELE (Social Engineer-Architect)

Possible polarization of the military--no longer representative of all facets of the society. Danger that the military will be construed as a place for the less competent who might then be ostracized by society. Military downgraded becoming im-

potent to deal with future and emergent situations.

The Navy is an important facet of society and a setting for the maturation of youth--continuing to provide a setting for learning about how to live, work with others, have fun, be responsible, and experience a variety of challenging assignments.



Defense as a by-product of other useful activities -- this might reverse the relationship where defense provided for other outputs in past, such as the Defense Highway Act and the Defense Education Act, and now make it the cargo-carrying Navy or the Navy as an educational institution first, and a defense force second. Note the importance of Navy training and Navy experience to later performance of individuals in other roles in society.

ROBERT HOTTEN (Environmental Designer and Researcher)

Upgrade Navy ship environments to Coast Guard levels.

Interpenetration of spaces; more volume free space, and access to light and air.

Expression of cultural diversity aboard ship and recognition of the possible contributions of many different cultures to the effectiveness of the Navy.

ROBERT LAWSON (Applications Engineer)

Commander, U.S. Navy, Retired

Get the hardware--that is the specific ways in which things might be improved aboard ship.

Redefinition of missions so that they are easier to accomplish, and are not, by definition, impossible or difficult.



GENE GLOYE (Research Manager and Psychologist)  
Manager)

Navy should be a place for all minority groups to get a fair shake and a fair chance.

Use of the Navy environment and their ability to control it as a setting for cross-cultural interaction and finding out how diverse groups can live and work together in a mutually satisfactory manner.

What men pretended to know and now have to find out for real.

CHARLES HARSH (Organizational Psychologist)  
Retired from Office of Naval Research

Apply the experience of urban planners in the public sector to the operations of a ship.

Find an effective lever for attracting Navy dollars to the task of improving the social and physical environment aboard ships.

JIM CALLOWAY, Lt. Cdr., U. S. Navy  
(Between billets)

Avoiding getting more required "habitability improvements" from NAVSEC to go to bottom of his priority list.

Less talk about the possible kinds of improvements and habitability alterations that could be done for ships and more discussion of how things could actually get done on ships--where the time and money and energy would come from.

If everything is properly allocated how can we find something with which to do more?

MIKE HEFFRON (Philosopher, Naval Architect, Urban Planner)

Quantification of the value of environmental improvements to mission effectiveness.

Translating the specifications for environmental improvements into "dumb kopf" so that they can be understood by those who have to carry them out and so their value and importance would be apparent.

LAUREL LAWANOWSKI (Social Psychology, Naval Environments)

Ability to involve other designers in producing concepts for environmental improvement aboard ships. Providing educational experiences so that other designers involved in the design of Naval ships who are not directly concerned with habitability can see the importance of the environment to the ship's functioning. Some way of providing it to them (meaning the Navy leadership) that environmental quality can affect mission effectiveness.

ROBERT DUBIN (Industrial Sociologist)

Environmental justice, that is, an equitable distribution of environmental rewards and environmental qualities to the whole group involved in the ship.

HAROLD GARFINK (Ethnomethodologist)

Willingness to be the expert on whatever isn't covered by anybody else.

Find out how to explain water to fish.

Hope to get to what it is that's going on in the ship that is invisible to those that are there, so that improvements can be introduced that would really make a difference.

MEL SCHWARTZ (Organizational Psychologist)  
Shipboard Manning and Automation Project

Models to relate overall indices of ship's effectiveness to

what is done to improve the environment for folks on board the ship.

Identification of measures to prove quantitatively that environmental improvements could reduce manning requirements and reduce costs and increase effectiveness, possibly using simulations.

BOB HOLZBACH (Organizational Psychologist)

Manning Level Research

Ways to relate expenditures on equipment and expenditures on people in terms of cost effectiveness to Navy planners so that a more balanced ratio of expenditures between cost of personnel and cost of equipment could be achieved.

Budgeting and accounting systems have key roles.

Look at how concepts, ideas, and recommendations might better be implemented. That is, how the implementation process itself might be improved for all ideas about the environment regardless of their specific characteristics.

MARIA GIESEY (Interior Designer-Environmental Needs Assessment)

Definition of habitability that would be widely shared and of special significance to decision makers.

Ways of uncovering people's patterns of informal interaction, communication, and the use of space.

ROSS VICKERS (Social Psychologist)

Organizational Stress and Individual Health

Concerned with establishing linkage between the organizational climate, its impacts on personal health and performance.

Establish structural relationships between the features of the organizational, physical, and technical environments aboard ships and their effects on personnel performance.

This would be a landmark conference if we do what we set out to, or said in our intentions we would do.

RENEE GOULD (Urban Planner)

Educational Systems and the Psychology of Development

The art of justification.

What constitutes proof and who is it necessary to prove things to in order to get them enacted?

How to live with uncertainty and the relationship of having to live with uncertainty and the requirements for formal kinds of proof.

JIM LA ROCCO, Lt. MSC, U. S. Navy

Former Line Officer and Director of Remedial Reading School

Integrate concerns with producing more effective people into the process of ship design and have ships designed by people with first-hand experience aboard ship. Include sailors in the design of ships.

Find a way to use quantifications of job satisfaction in the re-arrangements of ships for greater effectiveness.

LARRY DEAN, Lt. MSC, U. S. Navy

Former Line Officer and Director of Remedial Reading School, Fleet Problem Branch

In proving the shipboard health care delivery system to reduce the drain on manpower and begin to work back to the problems of the ship environment that contribute to poor health.



Recognize that implications for change involved by the all volunteer naval force.

Integrate and develop common interest of both the civil and naval maritime communities in the design of ships for improved habitability and the attraction and retention of high-quality personnel.

JACK BRANDELL, Lt. Cdr, U. S. Navy  
Naval Architect, Engineering Duty at Intermediate Level  
Maintenance Activity

Find ways to utilize sailors assigned to intermediate maintenance activities who just returned from sea duty as prime sources for finding out what's wrong with the ships that could easily be fixed.

Focus on new methods and new materials for immediate applications that meet present military specifications and safety requirements.

Probably not be able to provide completely for habitability unless able to calm waters and make ships so that they don't "rock and roll."

This problem on the surface effects ship is even more serious; it's crucial to deployment.

GEORGE RAND (Developmental Psychologist-Social Engineer)

Potential hope and disappointment at not being able to identify instrumental acts involving concrete actions that can be undertaken with official auspices to make effective changes in the ship's environment.

Continued reliance on abstract quantification of research goals which seem to be less influential in changing minds than intuitively successful small scale innovations.

Identify small places to introduce change from a look at the total picture, but avoid suggesting total large-scale interventions or innovations.

(Not being able to say exactly what he wants to in an understandable way until later in the evening when no one is there to hear):

Visionaries of one generation lead to sources of defeat in the next generation. For example, in public housing, the creation of serviceable and well-designed public housing to provide for those who cannot afford to purchase adequate housing from their own economic contributions or because of structural defects in the economy's way of distributing wealth. Then, the residents becoming prisoners of largesse in the next generation when public housing is already available, but also has come to be defined as a stigmatized environment which forever brands the resident as incompetent and impoverishes their interrelationships so that it is impossible to develop the competence to move to the next level.

To explain how projects in public housing in New York led to the tearing down of Pruitt-Igoe in St. Louis. But now less pessimistic about the ability of one to intervene and change the situation. It is possible to create very well meaning, but ineffective environments which include particular social and physical features that defeat their larger intentions and turn them from hopeful next steps into a syndrome of despair.

CHARLTON PRICE (Sociologist Reporter--Diffusion of Innovations, particularly social inventions)

Communication among technicians in this country is good enough so that if we all knew what we need to talk about, then we would have talked about it before we came, and there would be nothing left to say here.

Discover and distill the lore that is available from this room about what ought to be done next, what the next steps are, and how the various parties that seem to be represented might be able to co-conspire or work together to move forward their common objectives of improving ship environments.

Capturing the "thoughts going down the stairs," those insights which those participating in the conference will have on their way home, or after they get home, and try to incorporate all these ideas in a working agenda to be shared by all to address this issue in a more parsimonious and effective way in the future.

In different ways all of these ideas are related to facets of organizational effectiveness. Most of them were dealt with in the seminar. A few points deserved more discussion--and some separate volumes. But we were sure that there was something serious in shipboard environments to deal with, that we were the right people, and that there still were a lot of things to improve.

If anyone reading these materials has any ideas to share I'm sure any of the participants would be glad to have their insights.



Every man is occasionally visited by the suspicion that the planet on which he is riding is not really going anywhere; that the Force which controls its measured eccentricities hasn't got anything special in mind.

JAMES GROVER THURBER

### THINKING AND DOING — IN PARTICULAR

Doing nothing is a choice, an act. Its converse, doing something, is not simply a choice, but choices. Selecting a set of actions to deal with an undesirable situation, such as Naval ship environments, that will prove appropriate to the task--not overkill, not too little, no unwanted side effects--is hard. Choices that even seem adequate are difficult to find among courses of action to deal with complex situations in general, and environmental qualities in particular. In addition to their objective properties environments are perceived differently, have different cultural and social meanings, and shape different kinds of social interactions. So improving environments is complex--Naval environments, even more complex. This is primarily because of the competing views about what constitutes improvement--personnel retention, crew productivity, mission effectiveness, operating savings, . . . This doesn't mean that nothing can be done about improving Naval ship environments, but it does suggest that multiple constituencies be developed for each element of an improvement project--something for personnel, something for engineering, and a little benefit for . . .

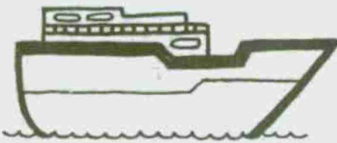
If God wanted naval ship environments to be better, He would have made them better.

### Good Topics Are Always Orange

If we included at the beginning of conferences or conversations only those topics which we could certify at the outset would be understood, cogent, and acceptable, we would be virtually prohibited from talking. At best, we would be relegated to repetitive exchanges about ciphers and operational measures. There is a reflective quality to any research investigation, or discussion about research. In the end, we are actual live people, doing design and research, and talking about it in order to instruct ourselves on how to do better or think better about concrete situations existing in our worlds. Much of the challenge of research is rhetorical. That is, it tells us how to think better and talk better about the problems we face,



or about what we choose to select as a candidate for a problem to which we can dedicate attention. Research facts are nothing more than common sense which has been rotated and transformed through systematic observation and measurement into "data." When the conclusions of science begin to depart from common sense an alarm has to go off to remind the scientist that his first constituency and the bedrock security for his investigation is provided by those things that everyone accepts to be true.



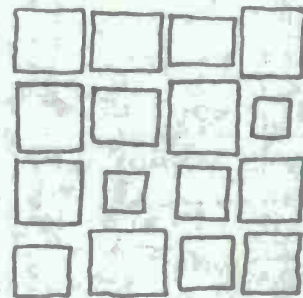
DISPOSABLE SHIPS

Take the example damage control. It seems perfectly evident and non-negotiable that a Navy ship cannot be run by the kind of skeletal crews which operate many merchant vessels. If a Navy ship "takes a hit" there is need for additional personnel to seal off the damaged area, fill in for the wounded, or to fight fires. Reasoning about these contingencies leads to all sorts of specialized standards about paints, building materials, and spatial location of functions aboard ship to prevent unwarranted injuries or deaths and limit the damages. But, it is conceivable that a system-analysis of the whole ship or type command system would show that it would be more cost-effective to build more destroyers and "let them go down" if they were hit, --based on the fact that these ships would be operated by small highly qualified 25-man crews versus present 250-man complements for similar ships. It might be wiser to invest monies spent on materials standards and testing in the invention of reliable escape vehicles. The savings on manpower over the life-span of the ship (say conservatively 225 million dollars) might be used to create ten additional ships manned by 25 men for each 250 man destroyer presently in the fleet. (This is not a bona fide proposal, but simply an illustration of alternative thinking.)

Science is true; it just isn't always useful. Once scientists begin performing their usual experiments to ascertain the fire-retardant properties of different paints and flooring materials, alternative methods of thinking about the mission of the Navy become virtually banished from discussion. It might be seen that the reason for concern about fire-retardant properties of materials is the Navy's conception of the "ship as country"--never to be abandoned or

rebuked. In some ways those feelings are less appropriate toward the modern highly automated vessel with less anthropomorphic properties than an older ship where the functioning of each system was clearly in evidence and widely understood.

Nonetheless, damage control is an important tradition of thought which has been built up over many generations. While not advocating the necessity or even desirability of change in these beliefs, it is important to recall that they emerged through countless tales, legends, and documented incidents. Science was and remains the investigation of commonalities among these incidents, their annotation, the search for a causal relationships or lines of reasoning. The design of systems such as Naval ships may be augmented by systems engineering and computer assisted design management; but it still remains a largely intuitive art--based on age-old wisdom in the form of conventions, rules, types, habits of thinking...

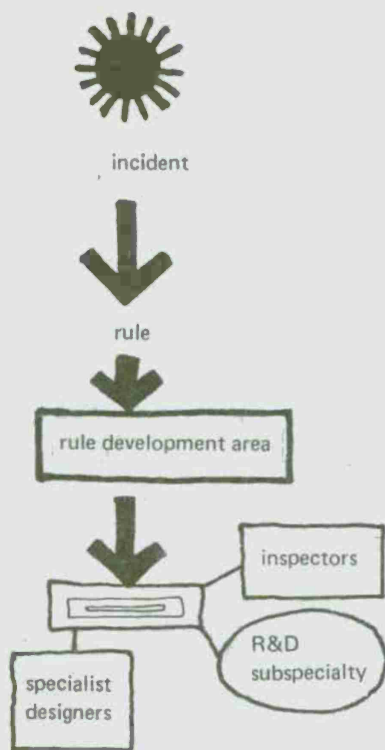


### Science in Search of Meaning

There are many instances of design of complex systems where the problems are so involved and profound that one looks to scientific data for some anchorage, a set of givens, constraints, fixed principles, in order to eliminate some of the variance. While this effort is laudable, it is important to test each claim by common-sense criteria. Otherwise, we run the risk of allowing the choice of paint and fittings to nullify the very traditions and meanings we are trying so hard to sustain.

There is another risk we run in this naive view of the contribution of science to design. In this age of scientific justification for what we do and think, we often attribute to some vernacular tradition the status of a scientific discovery. We act as if things which we accept as necessary must have been generated by legions of scientists as requirements "way back when." Often, in point of fact, they emerged like other vernacular discoveries, out of circumstantial solutions invented to keep a particular ship afloat and only intended as a one-time solution.

The Monitor was not produced by an incentive, multiple R&D procurement with a competitive sailoff.



Many, if not most, innovations introduced in large-scale systems are justified because of the relation of anecdotal facts from one situation to another rather than from a systemic and conclusive proof based on the "weighted sum" of the relative importance of a particular item, the scope of damage that might occur, [and] the probability of such damage occurring, and so forth. For example, Heffron mentioned that the whole series of damage control requirements for both ships and land environments are largely derived from particular incidents which have occurred. Most prohibitions can be traced back to ad hoc additions made in response to the particular experiences of users with the accidents and problems that occur in the field. However, building up such lists of safety prohibitions and damage control requirements in this fashion means that they often add enormously to cost, are very inflexible, and involve expenditures out of all proportions to the true nature of the risk and probability of occurrence of the event. In these instances, we may be unwilling to adopt the policy suggested by scientific experiment and system analysis because it conflicts with what we assume to be an unnegotiable verity.

#### What They Want is What They Get

A very typical response to the design dilemma is to turn to the people who will be involved in using and operating a system and seek their opinion on the matter. This is the participative planning approach or "tell-us-what-you-want-and-we'll-give-it-to-you, -and-you'll-have-to-be-happy" school of design. This approach treats users as if they were better able to articulate technical requirements and personal expectations through their naive judgments than the designers could.

Yet, the participation of the "planned for" in what is being planned is increasingly fashionable and even required. Ask them what they want and then do it seems to be the guide to action. Social science is invoked to better find out what they want, and then interpret what they really want.

The properties of this process might be better illustrated by an example. An all-black community exists outside



Washington, D. C. , near Potomac, designed by Rurick Ekstrom. He worked with this community for a long period. They had occupied the site of Scotland for a long time and had built what they could. The community and the architect embarked on an elaborate participative-design process wherein residents were asked about                      worked with models of all the units, and iterated designs and plans over a three-year period. Because the town was so close to the HUD offices, HUD officials would frequently come by to see how things were going. So a design for this little community started to emerge.

As they were finalizing the design, a Dutch-Colonial shopping center went up in nearby Potomac. Suddenly, the community knew exactly what it wanted. They wanted "Georgetownesque" row houses. They insisted on it. The planners were going to provide what the community said they want. There were many discussions but the people prevailed.

Now they ended up building those things. They went through all the approval processes and the little townhouses got built. They had little houses with lots of tiny rooms. The people started moving in. Soon they were very upset. They got very mad at the professionals because "you gave us what we wanted, but we didn't realize that we didn't know what we wanted, and we don't want this." They didn't like the fact that they insisted on Dutch Colonial roofs because they liked how the models looked. It was better to not have a combined family room, but to have a real separate dining room and a kitchen. Formal living rooms seem to be nice, too. But when you actually live in it, those distinctions, so important in the models, didn't make as much sense. Further, they were very upset that they had given up for a "stoop" their traditional big front porches which represented a part of community life. The community felt that it had been abandoned by the professionals it trusted because they gave them what they wanted.

In child development too there's a middle road between authoritarian prescription and complete permissiveness.

Some think as problems appear it should be possible to ask sailors what they want or give them a shopping list, and then put in everything they want. Even if everything they wanted would fit, it's very possible, even probable that they still

wouldn't like it. Somehow we have to look for those particular things that you find used. Returning to the cow analogy--you have to watch exactly what it is that the cow eats and then try to figure out how to incorporate it. The first time you almost have to incorporate some items on faith. There have to be large acts of faith and it may take more of a "revival" to make some significant improvements in ship environments than it does extra doses of wisdom and knowledge.

Before scientists prevailed over the world's habits of mind, often one did things first, and then assessed the results and formulated clearer reasons for the actions. Now we wish to base all our actions on advanced knowledge. We may have to reverse the process and go back to a tradition of experiments with ourselves. I think if there is anything young sailors, and young people in general, don't feel, is a chance to experiment with their lives. From the field of drug abuse prevention it is clear that one of the biggest reasons for taking drugs is that users want a chance to be involved in something that has genuine consequences, and that they can do something about. Health foods and mountain climbing, even bicycling, are examples of people taking risks to determine the consequences.

RISK IS NICE.

#### Would You Like a Boondoggle?

Do we always recognize boondoggles when they occur? It is easy for one person's boondoggle to be the source of another person's key insight. It is not always possible to specify at the outset exactly what it is one wants to get across, or exactly what one needs to know. In fact, it seems to be true for many learning situations that the learner is unable to tell ahead of time exactly what will be important to learn having not yet known. In many instances it isn't possible to know what was important to learn from a situation until long after it was over.

The past is still being reunderstood, not only by historians, but by all who attempt considered action.

This is not a call for justifications of boondoggles. Nor to be able to avoid boondoggles by specifying narrowly in advance exactly what it is that is to be derived from a particular learning situation such as a conference. Boondoggles seem



to be a condition that exists for the person who is attending a meeting rather than a property of the meeting. But it is clear that many conferences are held for impossible reasons and true that in many cases that the key purpose is to reward the attendees.

But when people gather together to share ideas and to build a platform for the future, there will or should always be, a surplus of ideas and possible explanations and a chance for negotiating about importance of things. It is hardly ever possible to move forward on all points in a simultaneous and integrated way. These are the kinds of actions contemplated by most conferences, "yet the world knoweth not these categories." Instead it is better to start defining from wide ramblings a few concrete things to do next and to meet again when those have either failed or produced a host of new possibilities.

Fears of a boondoggle also may stem from an inability to control the situation, anxiety about the frame of reference or distinctions employed, and a need for neat boundary lines to be drawn around the content that will be exchanged and the range of instrumental acts that might be addressed and advocated.



There are five principal types of boondoggles.

Then sometimes there are real boondoggles.



One has information only to the extent to which one has tended to communicate one's experience.

HARRY STACK SULLIVAN

### COLLECTING TALK TO GUIDE ACTION

The main reason that we are here is about habitability, particularly, habitability as better managing the environment: better as to the process of managing as well as the results of the management. We decided to pick a site like this (a working film production studio) to illustrate by example that one can in a large measure declare a place to be a place. We also wanted to counteract the view that maybe what we were going to talk about habitability as being soft on sailors and making the Navy into a country club, and all the rest of those saws you've all heard.

All of us can talk about our experiences. We've all had several thousand of them. We can say how they relate to the way habitability ought to be done from each of our particular points of view. And while that is interesting it hardly lets us in on what you'd do next, knowing what you know. We don't believe anyone here simply wants to repeat their experiences, having found the answer.

We would like to get as much as possible on tapes. This enables us to put together an interpretive summary. Such a document will serve as a shared platform--a joint mandate and syllabus for action.

What we are really talking about is the development of what I choose to call 'friendly models', models which, if you like, stand between the individual and complexity or chaos. The purpose of such models is to make the strange familiar, the disordered ordered.

ALAN SHELDON

### Off the Dime

Why is it, since we all know so much about improving environments that almost nothing is getting done. Everyone says, "Well, I'm doing this," and another, "I'm doing that." There are seemingly dozens of efforts going on, but little cumulative effect on the quality of shipboard life. Hotten can describe the history of habitability improvement efforts in the Navy since 1890. Many times there have been sincere and well-meaning efforts but more important things come along and the ideas are lost.

Maybe we all really need to share the kind of wisdom that goes before one actually does something. There is a notion of how to have a party before you know whether you are going to have punch or you are going to invite friends or mix in business associates. There is a notion of a project before you have decided exactly what it is that you are going to do, how it relates to the demands of the situation and what people's expectations will be as a result. We all know about successful features of projects that have virtually nothing to do with the content or objective of any particular project.

Also there are notions of strategy in undertaking interventions in a complex system. A way of fostering several projects to suddenly become a doctrine--a way of doing things. There are strategies for transforming separate interventions into an accepted program with its own justification, budget, managers, evaluators, and what all.

Since environment is the concept for everything, it's hard to find a place to start--there's no small everything.

We are interested in trying to illuminate those two points. Not that we're trying to skip over the particular details, but if one looks at the bibliographies in this field, there are replete with very special studies of what color does what to which when you're upside down. Habitability and environmental studies have been done. Not all, to be sure, but lots. But what has happened because of the ones that have been done? Very little. Can we change this? Possibly.

We've looked at enough of what is done in the name of environmental research to know that most of it does not have a clear next step. We're trying to build with you some kind of shared basis for believing the next steps.

#### The Great Quincy

Maybe this can be illustrated by some work that we did for the Department of Transportation about the Illinois Central Railroad. The IC had benefited from a large capital grant to a local transportation district that they created to purchase new commuter cars. DOT wanted to know what had been learned in the process of designing, contracting, building, and getting the cars into service.



You've all seen thousands of after-action reports and know what they are. In a detailed way, everybody is asked exactly what happened. They seem sinister and investigatorial rather than collaborative and learning-oriented. For example, the study team asks the engineer why did he decide to make the wheel this big, why the cars are 'x' feet long, why the door is in the center instead of both ends, and he recites all the justifications for his design including all the exigencies of the moment. Instead of asking the usual kind of questions we asked each person who had a key role, if you had a chance to start over again today, what would you do? A whole different kind of literature came out of that. Rather than defending what they had already done, which we might as well all agree was the best thing they could have done under the circumstances since little about it can be changed now, we led them into speculating out loud for those somewhere else who would do something next. If one just documents exactly what was done, one perpetrates always doing what was done yesterday, which was the best thing to do under the circumstances, but not for all time. Documentation of speculations about next time might establish a dynamic tradition, such as the can-you-top-this syndrome in story telling. Instead, we collect talk justifying our doing the best that we could have done yesterday to guide our actions in the future as somehow maintaining solidarity with the past.

When the Great Northern Railroad emerged with the Chicago Burlington and Quincy Railroad a firm was hired to come up with a name and logo for the combined railroad—they did—a big BN for Burlington Northern. Thus the world lost a chance to have a Great Quincy.

There is a different kind of a change model that one might invoke. The leading exponent is the Catholic Church. We've labeled this change mode "harking back to first principles." When you want to introduce a massive change don't say, "we have this revolutionary new idea." Better say, "Look, heresy crept in. About 500 years ago, it was originally believed that priests should be married, or whatever, and this other thing about celibacy got started in the middle ages, or . . . But now we are returning to first principles. In this way one can maintain solidarity with the past and still somehow get to the future.

If at first you don't succeed, try something older.



Let's summarize these two points about change and getting in position to deal effectively with the future. The Illinois Central example suggests not asking people what they did, but what they learned for next time while they were doing it. It is seldom possible to apply in a present context a prototype or a paradigm taken whole from the past. The adaptation we make are unexperienced ones because we simply don't know how those who did it then would do it again. By collecting this particular kind of anticipatory lore one learns less about what exactly was done, but learn ways of dealing with situations better in the future.

In the Catholic Church example, the prestaging or justification for change need not be an embracing of the future and a break with traditions, from the past. The justification for change can also be the rooting out of ways of doing things that grew out of exigencies of particular circumstances which contextual conditions no longer exist. Therefore, the institutional form or the organizational practice is no longer relevant. One returns to the prior state of affairs--the first principles.

We learned that no two ships, even sister ships, are really the same once in service.

It is no one's fault that these idiosyncratic responses born of particular circumstances come to be usual or ordinary practices. This goes on in every organization. It just means that one has to periodically reexamine practices and root out those that no longer fit the present context, circumstance, situation, setting . . .

#### More Research Means More Research

In discussions between researcher and research monitor it was said, "There is probably more information on relationships between the environment and psychology and sociology in the ONR files than the whole rest of the world put together. Most of it is unused." The rationale is that studies are done to advance knowledge and fill in gaps. The attitude towards each study is to do something new for the files. It doesn't matter whether the study comes up with positive or negative results--or results at all. The idea is that if its a new idea (which is what research is supposed to be about), then it's at

least 20 years too far ahead of time. So they will file it and forget about it and hopefully 20 years later someone will look it up and use it; or more likely, do another study.

A designer had the feeling that in ONR they didn't care if anybody ever did anything with results, as long as they got to do the basic research. In one sense, it's difficult to know in advance what research will prove valuable. If one had to specify utility in advance, very dull stuff of little future importance would be done. But, there still needs to be some carry forward from the interesting options for action that are identified by research. One approach, a translation function called social engineering, was identified in Mackie and Christensen's study THE TRANSLATION AND APPLICATION OF PSYCHOLOGICAL RESEARCH (Human Factors Research Institute, Goleta, California, 1967). This study pointed out the relatively large supply of educational research that was sponsored by ONR and other DoD agencies in contrast to the proclivity for not using this research exhibited by those involved in Navy and other DoD education and training activities.

If the problem is translation, more writing doesn't help.

The authors said the needs of the instructors and the findings of the researcher could be made known if, somewhat oversimplified, new specialists were developed to translate needs into research questions and hypotheses and to package the research results into instructional guides and technique catalogs.

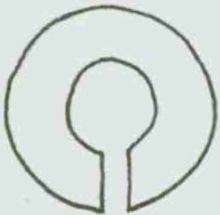
This translation function may be of great utility in translating environmental research into facilities management practices and in bringing back more relevant issues from the field and framing them into research projects.

#### Levels of Innovation

To package the insights that efforts to introduce improvements have produced as they were carried out we have categorized three different types of experience. This typology is based on the need for transferring information to others who will find it of interest, potentially applicable, even actionable.

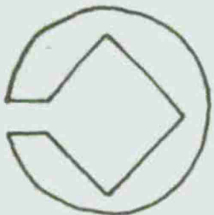
If a guy is looking for a better "whatsit", a systems framework is of little use.

Since distinguishing between types of experience by "audience" was new, there were no convenient labels ready to paste on them. So we invented some. These were first employed on the DOT-Illinois Central project described above and have been used several other programs since then. We think you'll find them handy. Each of the three types is described below:



UNIT SUBSTITUTIONS

SMATS are innovations or improvements that can be simply substituted--task for task with what was done before, or item for item with what was used previously. SMATS do not require major adaptations in related parts of the overall system, nor do they redefine boundaries between the steps or components that make up the system. Improved reliability, better work methods, easier installation, more durable fastening, cost-savings, and higher performance are examples. (SMATS are not to be confused with the Bostonian definition of intelligence.)



PURPOSIVE REARRANGEMENTS

DRUNS are new approaches for reaching performance objectives that rearrange the way in which the tasks were previously accomplished. DRUNS require changes in several parts of the system, and frequently define new boundaries between the steps that make up the system. Examples: new arrangements of organizational structures, designs that redistribute loadings or change the relationship of the elements in a particular task, or alternative contractual relationships.



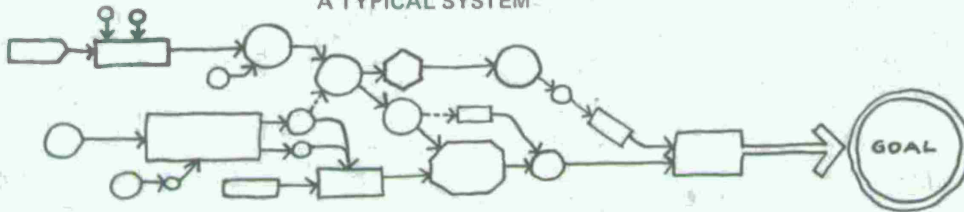
REVISED OBJECTIVES

GLEEBs are redefinitions of the problem or reconceptualization of the objectives for the system that could result in more appropriate solutions. Incorporating new objectives, extending or modifying the definition of the system being designed, explicit consideration of induced or spill-over benefits, and incorporation of new considerations are examples of how premises can be restated to stimulate major improvements.

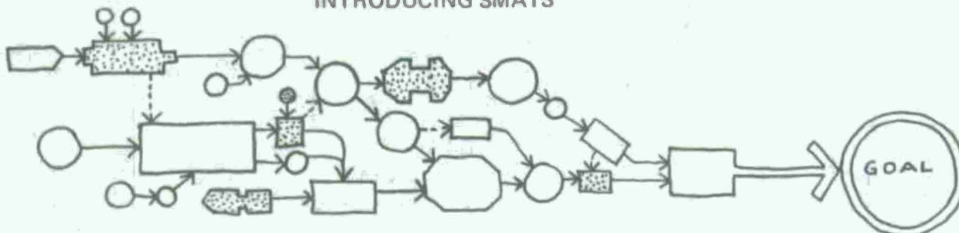
The differences between the three types of experience defined above are illustrated by diagrams of hypothetical flow charts below. The particular form of the individual tasks or operations indicated by the circles, squares, and other symbols is unimportant. They might be steps in any activity or components in any system. The first diagram shows the initial state of such a hypothetical system. The next shows the substitutionary changes that result from introducing SMATS. The one below shows the impact on the system of incorporating DRUNS. The bottom one shows how the introduction of a GLEEB affects the whole system. Together with the above definitions, these illustrations indicate the differences between the three kinds of improvements for systems differentiated by "who cares about what."

The words will be strange at first, but the tongue is a fast learner.

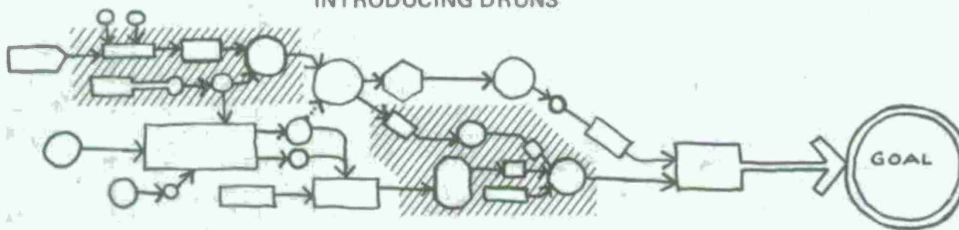
A TYPICAL SYSTEM



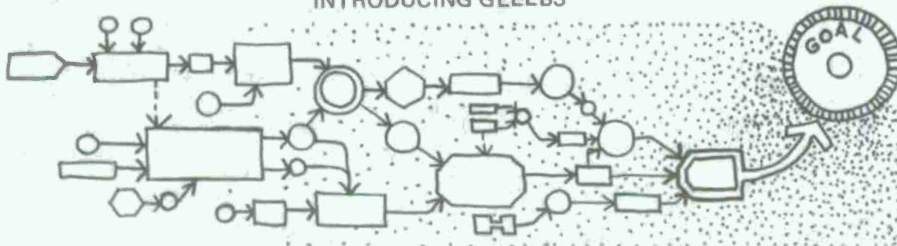
INTRODUCING SMATS



INTRODUCING DRUNS



INTRODUCING GLEEBs





The reason for recording these different kinds of items is to distill not only the facts, but the learning, of those who were involved in doing something once, to act as a head start for those who will be doing similar things again, elsewhere. In this sense "what I now think I should've done" is probably more important than "exactly what I did." Sometimes experience is applied to situations which are essentially different--but which are compellingly similar. As Mark Twain said, "The cat, having sat upon a hot stove lid, will not sit upon a hot stove lid again. Nor upon a cold stove lid." In the end each of us has to be the judge of what to apply, and where, and when. Training and experience in doing this will produce environmental management skills.

The history of gear cutting, thus, demonstrates the need of revision of both of the more common concepts of the history of science and technology. The romantic concept of invention is clearly inadequate, because there are many more steps in the process that is presumed by those who think in terms of rare acts of inspiration. The concept of a simple linear development is also unsound. Inventions do not emerge directly and inevitably from specific generalizations in the pure sciences, nor from a practical achievement in producing or controlling specific modes of motion. The records show so much interdependence, that the development can be adequately described only as a form of multilinear process.

ROBERT S. WOODBURY  
History of the Gear-Cutting Machine (1958)



May the great God, whom I worship, grant to my country and for the benefit of Europe in general, a great and glorious victory, and may no misconduct in anyone tarnish it, and may humanity after the victory be the predominant feature of the British fleet.

VISCOUNT HORATIO NELSON

A FORMER  
ASSISTANT SECRETARY OF THE NAVY SAYS

The things you are doing, the things you are talking about is something that has bothered me for the 30 years that I have had an opportunity to work inside of the Navy. Most of you perhaps do not know my background. So, just briefly, I'll tell you. I had 21 years in the Marine Corps and then later I became Assistant Secretary of the Navy. That's jumping from the bottom to the top in one big leap.

I know what happens on ships, I've been on too many of these ships. We have sort of gone around in a circle. When I was Assistant Secretary of the Navy, one of the things that I wanted more than anything else was to increase the habitability of the ships. No longer can we go around thinking that we can keep things the same as we did in the John Paul Jones' days and expect to have any kind of all-volunteer force.

In my job with manpower and reserve affairs I was able to look at this from the human aspect. This is something that the people there had never thought about before. That is that it might benefit the Navy to look at ship design from the standpoint of the personnel. They had always looked at ships from the viewpoint of whether or not they would do the job if you are in combat; whether or not it will do the job as far as storing things away; whether or not it was compact enough; . . . They could care less about the people on board. The fact was that from time to time, we have men who almost suffocated in some of those holds we had there. We had men there that would almost die before we could get them out. If there was a fire -- it was almost impossible to get them out.

I don't know how many of you have been on the USS PICK-AWAY. Don't go. Just forget it--because that was a hole if there ever was one. They carried me--I was an officer--and they showed me to an area and said now this is the officers quarters. I said, "This is terrible." And, they said, "You got it made, fellow--come on down in the hold and let me show you where the boys live." I was appalled. They were stacked four deep in one area and that there was just no way that a person could survive in that kind of environment, I thought.



We really started out to bring about some needed changes. I told them let's start thinking about alternatives to steel and things we have to paint. How about stainless steel or some aluminum where it doesn't have to be painted all the time. How about making sure that we have enough room so that the people can go from one area to the other without walking over each other. How about making sure that there is some kind of recreation space in there that can be converted to other uses.

I told them they should have the furniture that would go into the wall--that sort of blew their minds. They said, "What would you do that for." I said, "Well listen, if you had a bunk that when you were finished with it, you could take the bunk and stow it in the wall, you would have all this recreation room out there in front of you." "Wouldn't that make more sense than just having a bunk laying out there?" Well, that didn't make sense to them either. They said, "It would cost too much money."

People are a big cost of operations.

Well it would cost more money than the way we were doing it at the present time. We knew it would cost more money for material. But the fact is that you have to have more people to do it. You could have fewer people to manage the ship if you make things sensible and workable. And people cost more than things--even then, and they're more now.

That's the things that I worked for for years to try and make kind of workable. It is very difficult to get that across. You have to go in easy. I went in rough. If you go in there with a real bright new idea to make a change, they are going to tell you, "Too radical," "You're a little ahead of your time," "We don't have the patience," and "You are just too far out." Remember, they even told that to Rickover. But, he was stubborn. He just didn't pay any attention to it. We would still have been trying to work out a nuclear reactor for a submarine if he listened to some of the people who told him that it couldn't be done and, if it could, it wouldn't work. Every time you go in with an idea, someone will say what will and will not work.

To begin, you begin, gradually.

The important thing is that you have to make a start. And I would say to you that when you are looking at this thing from the standpoint of implementation and really making some changes; make changes, but make them gradually. I think that things will just blow right up in your face if you try to push it ahead all at one time. We need it now--we actually needed it yesterday. I'll be real honest with you; it was before yesterday that we needed it.

Some of the ships we are building at the present time are beautiful ships. I commissioned the USS CALIFORNIA. I

thought that it would just have to be a great ship, until I went inside. They got the same old stuff in there they've had since World War II. Everything is designed just the way it was in World War II. The only thing different about it is the name on it. Inside, that's about the only new thing that I could find.

I don't know why they don't want to change the concept of life aboard ships. But if we'd change it, I think we'd be able to get new men to come in and they will not, first off, feel they're being put into a hole.

Tradition is traditional.

These are a few of the things that I saw and some of the things that I tried out:

- (1) Make sure that the messing area is one that is right for the men. Not just a big line for people that are coming in. Make sure that everything is stainless steel, so everything can be cleaned very easily.
- (2) In the living areas--make sure that in some way you utilize all the space. Put some of the things away, out of sight. Fold them into the walls if necessary. Try bunks you can pull out. If you designed it in the right way, a few men could push up a lot of these bunks and things and you'd have a lot of space for the men. When you are going to increase a ship's complement and add more people, then just pull down this bin or pull out this bunk and you have more capacity. You see what I mean. That way you won't have a place that is permanently crowded. For example: if you take this room (the movie studio) and you have only a few people then you take out some of the tables, and it looks fine. But if you had to leave the tables here you'd look lost, you see. So that's the same way that I think a ship should be designed.
- (3) Last but certainly not least is the fact that we have to put sensors and computerize the ship in such a way so we can get people out.

I hope you listen to this very carefully. Up to the present time we have never had an early warning system to give the people a chance to get out if there is a fire. We rely solely on the fact that somebody might see the fire, and that they then will call someone. I believe there should be smoke detectors throughout the ship. They should be geared to that guy who is sitting there on the bridge. He should be able to see there is a fire in that engine room or someplace. Even if it's just smoke, the bridge would see it. He would know exactly where it is and could get someone down there to put it out. Not just to save a life, but to save the ship. Because, if you can find

Remote-sensing and communication systems can extend individual's purview and effectiveness.



out about a fire early enough, you might be able to save the men and the ship. But if you don't know there is a fire for 10 or 15 minutes, you might not be able to save the ship or the men. You could always guide them out, if you knew exactly where the fire is.

These are some of the things that I tried to push. Every time that I tried to push them for safety, someone would tell me either that we don't have the money or that we tried it once before. That is just a lot of stuff. Don't let anyone tell you that something can't be done. Something can be done. One man can make the difference. One man made the difference in the beginning of our country--George Washington. Another man that made a difference was Abraham Lincoln. One man. So one man or one woman can make a difference, so don't let anyone tell you that it doesn't.

Quality national defense may have to come as a byproduct of doing lots of other things.

The reason why I'm so concerned about this is the fact that I would like to have a strong national defense. The Navy is as far as I'm concerned our only first line of defense. The fact that at this moment, we are not at war doesn't matter. The Navy still has the same function that it does in war. It patrols, it ferrets out, it monitors, it gathers intelligence. The same functions, the same danger. A ship could go up anytime. So that is your first line of defense. That's why I think we should always have a strong Naval organization. Further, in order to have a strong country we must have some kind of security and I believe the Navy contributes mightily to it. I love this country of mine. There is no other country that I have ever been to, out of the 44 that I have visited, that I would trade for the United States of America. This is the greatest country in the world. In no other country could a young lad like me, born on the wrong side of the tracks, educate himself and become the Assistant Secretary of the Navy, except here in the United States of America. For all that people tell you about how wrong this country is, how bad it is, don't listen. Don't let that sink in. Just remember, when this country's wrong, we as Americans working together, should do everything we possibly can to make that wrong, right. When this country is right, then we as Americans should do everything we possibly can to keep it right. We should always remember that right or wrong, America is still our country and it is the only one we've got.

When you leave here, don't leave here feeling that everything is falling apart. Leave here feeling just a little bit prouder that you are an American. The fact is that you don't have to be born in this country to be a good American, that's what is so good about it. It doesn't matter where you were born. What matters is what are you doing here and what you are going to do in this country because of that. So leave here

feeling just a little bit prouder that you are an American and stand just a little bit taller among your peers. God bless you, and have a nice conference. If I can help you in any way, please let me know. Thank you so very much.





Events in the past may be roughly divided into those which probably never happened and those which do not matter.

W. R. INGE

## CHANGE AND LIFE AT SEA

The old order used to "changeth," now it is the new. Societal change can no longer be thought of as an occasional occurrence, but should be seen as a continuing metamorphosis. Change is a way of life. But, our ordinary ways of dealing with life were fashioned for stability. Our acts of personal planning such as educational choices, career selection, financial investments, housing decisions, on down to car preferences, meal preparation, party hosting, and what to wear are increasingly plagued by change.

For organizations the variability of the planning context is even more difficult to deal with. In the last year alone high interest rates, inflation, oil shortages, and investment mobility have created many problems--as well as some opportunities for those who were prepared. For large, complex, venerable organizations, such as the Navy, the problems of coping with continuing change are critical. This is particularly true with respect to attracting youth to life at sea. First, many more options for young people exist. These come complete with their own myths, adventures, justifications, and appeals. From devotion to the "sacred master" to hustling sales for the hottest item, the options for youth are great. Youth is supposed to know what they want and now find less need of justification to leave home and seek their due. Meanwhile, "out at sea," improved offers of post career relevance for training and experience mixed with some adventure and chance to prove yourself is being offered. While there has been an up-turn in retentions, a serious manpower problem is yet to be faced. Among the changes that are likely to affect the attractiveness of life at sea are:

By the way, if you'd like to jot some notes of your own out here, it will make this discussion more yours--a more vivid part of your experience.

- higher education levels and aspirations for the average person
- development of a pattern for selecting personnel with lower capabilities
- differentiation of life styles to limit the appeal of any particular offering

- increased diversity in sex and familial relationship preferences
- integration of Naval Reserve activities
- higher training costs
- greater individual interest in personal development
- need to maintain a broadly representative military
- multi-functional utilization of military capacities

### Education and Change

Advanced education is now available for most people who seek it in this country. Involvement in some form of continuing education is becoming widespread. Along with this emphasis on education comes the expectation of higher standards of performance for the many institutions that make up the society. The minimum acceptable environment which people expect and demand to claim as their "own" is subject to a revolution of rising expectations. Individuals can be expected to insist on increased variation in the performance and meaning of work; to secure opportunities for expansion of their educational process both on and off the job. As education begets the desire for more education, it also strengthens a desire to actively participate in the decisions which affect one's life. Further, people are less likely to accept the emotional defeat of unredeeming competition with peers on the job, and have grown to expect some degree of social support from their colleagues. This means they wish to have work structured such that it provides for esprit de corps and mutual assistance as well as old-fashioned competition. Finally, they wish their current efforts to make sense and to lead by increments to a more articulate conception for their future. They want to achieve a state where they can draft career objectives and think about the years to come in a planful manner.

In other words, in addition to fulfilling expanded expectations for the dignity and meaning of their current tasks, people desire their jobs to provide them with tastes of what they might become and a sense of where they can expect to be in the future.

The Navy as institution might learn from education and religion as institutions about adaptive survival.

If this characterization holds true, then military institutions should expect to play an expanding role as educational agencies. This is not that education and training are not big now, but their scope and acceptability must increase. Concentration and specialization on what the Navy can offer best (the sea) and making special emphasis on their ability to provide responsibilities--field experience and repeated trials in a wide range of disciplines from medicine to mechanisms will probably prove effective. This will necessitate, at the very least, the forging of new forms of cooperation between military and civilian institutions. In the long-range view, it may lead to some important changes in the definition of military functions and of civilian roles within these organizations. For example, it may be necessary to forge relationships between industry and military for, mining of the ocean floor or ocean-agriculture building on the model of cooperative relationships in space-probes and recoveries. Specialized military facilities and technical laboratories may need to be opened up to wider civilian use as new situations and requirements are encountered by the country in general. Finally, the military may have to rely on civilian educational institutions more directly as training becomes more demanding and manpower acquisition more competitive (e.g., unique advanced degree-programs in remote locations instead of equivalency degree programs).

### The Changing Sea

In part these changes in the conception of the Navy will be occasioned by modifications in world society. The majority of governments in the Western World have failed or experienced major crises in the past six months--among them France, Germany, Portugal and the United States. In addition, these governments are attempting to manage a transition to formalization of international government in those functional areas which increasingly need these agreements. As successive agreements are forged concerning control of international corporations, basic resource flows and armaments, as well as the division of the seas according to new traditions, the assignments and the missions of the Navy are likely to change

The presumption of a "plateau" after a period of change presumes too that the dimensions of interest will stay the same.

substantially. Ultimately, the Navy is servant to a certain conception of world stability. As the context changes to include more lively diplomatic negotiations, the Navy will be required to serve these objectives.

The need for military ships is likely to become even more important than it is now. And there is every indication these new roles will demand more diversity, adaptability and finesse in both personnel and equipment to match the complex international agreements which are likely to emerge. Perhaps ships will have to have another mission (like Soviet trawlers) to offset their costs and to justify their presence for long periods of time in foreign waters. Or, ships be designed for Coast Guard like activities such as patrolling "American waters" which are not located near our shores, or in protecting American ocean mining investments in waters controlled by another country.

While the Navy will always be prepared for all-out wars and missions to support allies, these new roles may require some mix of scientific-technical research activities and on-the-spot diplomatic assignments, to maintain preparedness and core functioning to adequately discharge a ship's mission. A first step in this scenario might entail the proper charting of the seas and its reserves of minerals.

This is the perspective we have in 1974 trying to look past 1984. Beyond that date to the year 2000, we can expect the character of governments and sovereignties to be altered substantially, and need to expend some portion of our energies to begin now creating the traditions and engendering the myths which will make the institution of the Navy capable of adapting to these new requirements.

#### Altered Views of Old and New

Discussions moved occasionally into commentaries about the general ambiance and qualities of personal interaction aboard ship. This is a highly subjective area largely without objective data collected over prolonged periods of time. Yet there are some general agreements--although often publically



denied--about what the exchanges aboard ship are like. The descriptors of the key categories are racism and vibes. The most significant new social phenomenon is the development of what might be called life-style groupings or cliques around which social life aboard ship for most of the crew revolves. Although discipline formally prevails, informally there is a lot more "negotiation." There exists an underlying attitude that one would like to stand up to his superior officer and tell him to (expletive deleted). The underlying attitude was legitimized to a great extent by blacks who entered the Navy with a well-formed behavioral stance which might be characterized by the American Revolutionary motto--don't tread on me. The real breaking point, on the ships today of the "telling-them-to-get-screwed" syndrome is between the chiefs and the commissioned officers. Again this grew with black chiefs' and officers' racial fears--fear that the black crew will side with the chief and "get" the officer or that some kind of racial incident will occur that will cause a lot of problems and produce a bad rating or worse precipitate some "congressional." Word has it that about one percent of the chiefs are black and over twenty percent of the crews.

"Of that one percent of black chiefs, I would guess there isn't ten percent of them that would not tell any officer on the ship including the Captain to (expletive deleted) and get out of my territory."

Regardless of the truth in fact of these casual reports, the attitudes and basically racist views are clear. These attitudes fuel any tensions and constitute a significant feature of the social environment aboard ship.

The normal administrative and management protocols for ship command are ineffective in dealing with situations when the candid descriptions run like:

"I can not bide the motherfucking guys who will stand up and just be assholes about it. But, the blacks that I've had who were good at being what they were supposed to be, were better than any of the whites."

In many commands the belief is that the blacks are revolting against them. Increasingly, the younger whites and "renegade" chiefs are taking stronger postures and they are more

It would be interesting to try to get some real data about the everyday interactions aboard ships.

often seen as "the enemy"--instead of a "particularly spirited crew" which would have been the likeliest view that would have prevailed before.

"What most guys are faced with when they are commanders is how to make use of racial equality, minority equality, or what have you. Integration has happened. Now, how to make use of it. How to stack up the ten or twenty percent that shouldn't be in the Navy at all. How to get them out fairly. And by letting them out create better attitudes and have fewer sources of problems."

"There should be some system. The paper work and reviews, et cetera, are almost not worth it now. Maybe much could be done at the end of boot camp to just straighten things out right at that point."

#### Changes in How We Look at Things

The professional turf in working on improvements in shipboard environments is being staked out.

One of the things we would like to propose is that we don't want to turn this into an ideological war--this is your place, versus this is somebody else's place. That in a sense has been one of the problems. The management people and the organizational development people have their version of what are the important systems, operating requirements, the real technical data, . . . The habitability people, typically, have come from left field with another set of claims, claims that are born of hotels and other structures within our culture. Then there are psychologists that come with claims that people need environments that they can relate to.

Let us try not to adopt any one of those points of view. Everything that we want to generate in terms of environmental improvements can be generated within the operational, mission-oriented working environment. What we think has been left out in the past is to think about that environment in an educated special process. We've used the term "social protocols" to denote what occurs in living the work of a situation--like a ship. This concept is somewhere between the informal things that happen in social interactions and the formal role defined in organizational terms. The definition of these social protocols or ways of behaving and posturing may emanate from and are especially relevant to the everyday working environment. That is what we think hasn't been

studied adequately. We've tended in the past to look at the person as a physical being and psychological being as if that has nothing to do with their work, and, further--as if these and other features of the person could be viewed separately--that the minimal adequate environment should be determined accordingly.

Whereas, if the conditions of a person can't be transformed by their relationship to work--to the individual's social value, then any amount of unrelated environmental improvements are likely to be of little value in improving or sustaining improvement in the perceived qualities of the setting.

So we're trying to invent a new intermediate language which is situation-specifically derived from experiences in this particular environment, namely the ships. To some extent this language may be an additive to those similarly derived from other environments, other closed settings, other institutional settings; but basically, we want to avoid making broad recommendations from faith or narrow recommendation from science.

We want to see the situations on the ship freshly and use this information to generate candidate protocols. These can be tried and adapted until they prove themselves in the situation. These protocols will then have their own validity. Being established in and of the setting the protocols will serve an impetus for their own continued development to maintain their validity both in social terms and by the effectiveness which they produce for meeting the requirements of the Navy.

Life is not only life, it's also a metaphor about life.



It is not the situation that makes the man, but the man who makes the situation. The slave may be a free man. The Monarch be a slave. Situations are noble or ignoble as we make them.  
FREDERICK WILLIAM ROBERTSON

## THE PUZZLE OF HABITABILITY

Cognizance and competence are negotiated by professionals. What-is-going-on is self-explicating. It would be much more orderly if the divisions between different classes of activities were declared under constitutional authority. While cleaner, such definitional demonstrations would no doubt produce languor and inertia. That work is done on the job, and life lived at home is being negotiated. Harold Garfinkel spoke to this point by analogy:

Garfinkel: Look at Howard Becker's work on jazz musicians. This study and other studies in occupational sociology are about the subject not what the subject is about. Becker's study of jazz musicians talks about where the musician works, how he gets paid, how he does his work, but there's no way of finding out from this account just what goes on between musicians and the nature of their experience collaboratively, making music. So there is no account of how musicians are actually doing their local work as they do it. You get instead descriptions about that.

In talking about the shipboard environment--the issue of living aboard ship--the thing we're missing is the descriptive stuff that really is available. For example, stories were told here about the radarmen hanging out in the combat communication center when they are off duty, or how people feel when they are assigned to the mess detail and are doing the work on the mess deck. The people who are into the work are living the work. But, the official accounts of it omit exactly what they and their coworkers know about, but which they find unnecessary, or unprofitable, or unacceptable in turning to account. In giving an account of that work, what is assumed, and the rest is reported. So when you come to talk about living, you find that it

The Navy as it's doing its navying on ships is more than people with different backgrounds and competences following orders.



either has to do with something back home or you don't have the data available. Talking about living the work is like living the family meal, or living the conference. In describing this we already agree to a kind of an official vernacular that omits exactly what we want to deal with, namely, exactly what's going on, how, here, as we meet.

Thus, the essence of the scene, setting, environment is the very information which is usually missing from descriptions about a situation. It is also a reason why those who know the situation directly seem to have exclusive rights to interpret the accounts and support improvements because they have the intimate knowledge of the situations that fills in what the usual accounts omit. Others who attempt to suggest improvements appear foolish. Yet, it is from outsiders that the most promising kinds of improvements might come--but they don't know from the situation how to frame their suggestions because the critical information is missing.

#### The Politics of Habitability

It would be helpful to caution ourselves from unraveling the whole ball of threads, inasmuch as all problems are interconnected. But it is hard to know where to cut the thread. Habitability refers to properties of the living environment--but where are lives lived aboard ship? --On watch? In battle stations? In hotel quarters? At mess? Thus, the problem of habitability may be more political than physical. What is chosen to be paid attention to and where improvements are suggested and expected is not technically determined by some weighted objective scaling, but by what comes to be defined as significant in the life of a ship. It would be different for each ship--and it seems to be.

The use of the term "habitability" connotes acceptance of pre-defined general categorizations and a technical jargon like that

THE SQUEAKY WHEEL  
GETS THE GREASE.

used to define jobs in organizations: there is a primary task, "that which has been officially designated as the specialist responsibility"; some secondary tasks; time and space for "just messing around" or entertainment and recreation; training and education; and eating and sleeping. These modes of description do not characterize the nature of the "work" that goes on in any one of them. Rather, they describe the activity from the purview of a personnel officer. The "work" in any of these settings bears analogy to the situated activity of the jazz musician, and can not be separated into job-life/home-life categories as neatly as one may like it to. Indeed, life aboard ship has a greater and more diffusely pervasive work-component than life in the usual land-based society.

Habitability concerns are often confined, nonetheless, to the non-work, domestic, personal facets of life. This suggests that it may be a kind of euphemism or a surrogate for a debate about the legitimate activities that can go on on ships. Once the issues of what should go on are addressed seriously, the justifiability of distinctions between the so-called hotel spaces and work spaces will seem less important if not trivial.

Garfinkel points out this possibility by his analogy to a conference on community schools at the University of Nebraska where the group spent the whole week defining what was meant by community; only to realize it was a euphemism and a justification for conflicts about curriculum and staffing of schools.

Rather than try to divide up the world precipitously into work and home, job-design and habitability, it may be more important to discover the meaning of settings aboard ships and how life is lived moment by moment within them. But there is often such a strong "life as usual" quality to settings that one has to look at them in a new way in order to see what is holding them together and making them make sense to those who live them in the first place.

### Knowing the Weather--Indoor NOAA

Scheele asked how ship commanders or executive officers know when a ship has dead weight aboard and it isn't functioning well. What are the signs, the trigger signals? There was no real answer to this. Yet, commanders seem to know. Like mothers with their kids, even though they're not there they seem to see. What are the clues to normalcy or abnormalcy? Does each commander learn to spot these clues himself. Is there a body of knowledge here? Is this management insight related to the cheating on preventative maintenance activities in that such step by step procedural specification of attention is seen as superfluous to the aware commander? This seems to be a potentially rich area for research.

### Cooking Up an Environment

You'll always have some menial jobs. Mess cooks are one example. Whether you come from an A school or direct from boot camp, you're non-rated when you first come on the ship. This means being assigned to mess cooking is a routine standard procedure for three months. You get it no matter what. The detail is maybe added to a little bit by a CPO sending down troublemakers. Mess gets these a little more often than the Supply Division, because if they mess up in supply its that Division's responsibility. This is a habitability problem because it creates a situation where the people who are on the mess deck are likely the slobs of the ship. The way they tend to go about serving people makes a lousy impression on and conveys, at best, indifference to the rest of the crew. So, what happens on the mess deck affects the whole ship.

Letting menial jobs remain menial will be like saying, "nothing can be done about small leaks and smoldering fires."

These effects can be positive as well as negative. The menial jobs we have always with us. But, it might be possible to re-organize and give new meaning to mess assignments. For example: They could have expanded rules and responsibilities for menu planning and earn special privileges or other rewards

through crew and officer evaluation. This may not be the right approach but something could work. This means that the ship could continue to tolerate a certain number of less with-it people without providing them a basis for "recruiting" more "out-of-its."

The Navy line officers present said that food offering and service has been diversified and mess facilities have really improved on board a lot of ships. There is now usually a square meal menu as well as a speed line--for hamburgers or whatever. Maybe there could be more specific recruiting for a re-defined and expanded mess duty.

Hotten: The quality of the food service has an overriding effect over any habitability situation on the ship. We saw a reserve training ship in San Diego in which the cook would get very depressed and angry because of the bad performance of the galley crew. As a result, he would cook poorly. The food was terrible. The cook's getting depressed over the galley crew had a bad effect on the whole ship. No amount of bright curtains, nice paneling, or zippy music can reverse this. The olfactory nerve, like no other, is plugged directly into the brain. It overrides all other signals.

Another's comments expands on this point:

Calloway: You can panel, drape, and carpet all you want, but there are some people who just don't care. People gravitate to certain areas aboard the ship. They hang out there. It's their turf. And these relationships are important. So, it's more complex than making cosmetic changes. A bitching sailor is a healthy sailor.

Demarking "gathering" places and reinforcing interlocking sets of relationships can be done in many different ways. What works best we don't know because these objectives haven't been tried enough.

When the Navy has a common enemy, you have a unified people. There once was that "can do" spirit. Now, the Navy's not selling service to America, they're selling retirement. That's an expensive item because a very large section of the

budget goes into the personnel costs. Not even costs for present personnel which are high enough, but the costs of past personnel. It's tough to motivate a man who came in to retire, and to have a good time when he can along the way.

#### Improving How the Environment Is Improved

The prevailing way of going about improving organizational effectiveness has come to be divided along lines which are now traditional. There are psychologists who worry about personal and individual performance. There are human relations and minority problems specialists. There is a whole group of what would have been called counseling professionals grown up to deal with personal dysfunctions, alcohol abuse, drug abuse, . . . plus the chaplains with their kind of assistance.

Much of what people say is troubling them is anchored in environmental beefs. So, added to the "people mechanics" there are an increasing number of environmental specialists who look at the ship and say that this and that could be improved. This and that might include better overhead coverage and lighting, higher attenuation performance for sound barriers, improvement in the appearance of the ship, the addition of curtains and special recreational equipment--all to enrich the environment. What all this staff assistance in people and facilities improvement seems to have done is to take the locally responsible division officer or department head off the spot. The effect of this well-intentioned staff support is to take away from the local commander the direct responsibility for the "climate of the ship" and its effects on the morale of his own men. This erodes this functional leadership as well. This, in a sense, has been an invasion of the specialists. The special access to the captain of these specialists further erodes the line officer's, and even the chief's, willingness to deal with undesirable situations or conditions in anything but a perfunctory way. The rule is only do what you have to and don't

In the best of worlds, having a specialist for everything means that any new problems will be unassignable to a specialist and therefore nobody's business.



risk trying anything because someone's nose will get out of joint and pretty soon you'll be explaining it to the captain. More and more it's strictly CYA.

What seems to be necessary--if one is to improve the adaptive response of the Navy in the future so that it can invent an improved posture and way of doing business--is to restore the responsibility and authority for making changes and having an effective working group to the local division chief or department head. If habitability and environmental management continue to be looked at as the task of a series of specialists areas all subdivided into separate fields of concern the efforts are going to be more expensive and of limited utility. Since most of these specialized interventions occur outside of the everyday context; through special meetings, work done by special crews or contractors and special surveys, and are evaluated by special reports; there is no local involvement. What is done is viewed as meddling, or not what we would have done with the same money, or interference, or some boneheaded idea, and is perfunctorily lauded but essentially resented.

The motivation and effectiveness of the responsible local person on the scene to do something about it is reduced. The situation becomes moribund. Not-invented-here resentment builds up and further leaks away the impetus and capacity of the responsible local manager to effect meaningful improvement. The ability of the most talented and insightful specialist to arrive at meaningful solutions to everyday problems in the Navy is virtually neutralized by their inability to see those problems in their specific context. The contextual information--particularly about latent resources and opportunities--is immediately available to the department leader or division chief. What they need is some ideas about how to approach different situations--not canned solutions, but tips and hints. They can probably get the job done if they are given the responsibility and credit, provided access to advice, and protected from "inspectors."

### A Clinical Change Approach

Price: On a ship with all its complexity and all the things that happen a prescriptive, deficiency-correcting approach is probably doomed before it starts. It seems to me that environmental improving must build up its method inductively to be effective. The model is more like a clinical practitioner's than a research experimenter's. One can make improving the environment like treating a patient instead of experimenting with a laboratory animal. When you are treating a patient you try something to see if it works. Then you write that up in a clinical paper and somehow decide what you learned, then you keep trying new things and in effect follow your nose.

### Is There a Habitability?

Heffron: We're not here to explore how to do experiments.

Scheele: But there have to be paradigms.

One purpose of the Navy has in holding this conference is to try to address how to improve the kinds of people who come into the Navy and what use is made of them by improving the environment.

Heffron: It's not clear what kinds of people the Navy now has. Maybe, it's not clear, they are good enough. Maybe we could even do with lower quality people. This, incidentally, would be cheaper. We could redesign the jobs instead.

Rand: The way I see our mission at the conference is to focus primarily on habitability, but you can't talk about creating a habitable environment independently of the work that takes place aboard the ship. If you have a smaller crew, or if jobs are defined differently, there is a different hierarchy, status system, and communications pattern among the men. With this the definition of their environment is changed. So we have to talk about both, even though we are focusing primarily

Like the Loch Ness monster, habitability has been seen but never captured.

on habitability. I favor this approach because I don't think there is any single normal way of defining what a minimal environment would be.

Scheele: You can't deduce the environment that will prevail on a particular ship from its missions or general objectives, or even from what has occurred elsewhere on that ship type. You are severely limiting the way you design the environment if you try to do it to make up for individuals inadequacies or problems. The environment should provide occasions and structure to promote the development of competence and maturity for individuals.

Garfinkel: I would suggest that we not get hung up on defining habitability. Let's talk more about the kinds of issues that Schwartz was raising, which take us into organizationally interesting questions.

This would mean more "sea stories" mostly not from the researchers.

Rand: You see to make it work you then develop a technical assistance mission. Which means, instead of writing technical papers or specs, habitability specs, what happens is you develop all kinds of experts that have had experiences making these modifications. They can be helpful to the person in need of help by giving technical assistance based on their experiences in the system.

I was on a ship once when . . .

Price: They (the technical assistance specialists) could work with the maintenance activities when it comes time to doing the routine maintenance things on the ship. Thus, environmental improvements could be introduced based on real experience when the ship was in maintenance. Some of the crew might also be involved to diagnose situations and respond to approaches.

Rand: Clinicians are really designers. As well intentioned

as most managers may be, they often are simply not designers. They don't know how to go about problem solving and creating options the way a designer does. This is what's happened in a lot of businesses--in education for instance, and certainly in prisons. You know what LEAA (Law Enforcement Assistance Administration) money has done for prisons. Prisons are totally different places. They now are more like junior colleges than the Bastille. This came about through the same "clinical" process by looking at the situation and seeing what's going on in other possibilities--even coed.

There is a limited number of critical places where we can affect change in a system like a ship. There may be 30 or 40. It's certainly fewer than the number of people who are working on it. These opportunities are first of all in the work but also in the movement patterns, communications, recreations, avocations. But, there are a limited number. It's important to identify one, concentrate on it, and developmentally expand its improvements to change related situations.

The critical difference seems to be that clinicians do discover and then transfer understanding while experimenters hypothesize, test, and develop knowledge. Maybe it applied, but a lot isn't, nor is it relevant. Each ship is its own unique situation.

Garfinkel: It's impressive to me the amount of experience in the room. Mel started to talk about a collection of tasks that need to be done in the Navy. We got part way through the second, when we got hung up on definitions.

What Mel was referring to was the structure of inquiry, which one is organizationally cogent. In other words, when you talk about a certain kind of information or getting a proof, or the necessity of getting a proof, you are talking about it in a way that isn't different from the organization saying "This is what I need to know to believe and give something a try." If he

would specify a little more of that and we could get a feel of how it is to be aboard ship, then that would take us deeply into the work of making ships habitable.

Needless to say, the discussion never quite returned to these points--but the points have been noted. There is a need to specify, not habitability, but how the Navy can be led to believe something is worth doing or trying. And, more important, lots of sea stories--the stuff. The stuff is also the puzzle. It fails to fit our categories. New categories won't help much either. A chance to try things and see what works is needed.





What is called realism is usually a record of life at a low pitch and ebb viewed in the sunless light of day--so often a drab waste of grey and white, and an east wind blowing.

WALTER JOHN DE LA MARE

## CONTEXT CREATION

Although the functional character of any institution is fairly well fixed, the meaning that we give to the activities which engage the organization is "up for grabs." What is a ship? -- A weapons platform?, a symbol of authority?, a special 24-hour community? We can choose to view the Navy as a nexus for a linear history--an institution which has changed little in any substantial way since John Paul Jones--or as an experimental social laboratory, where meanings and myths about the purposes and goals of an organization are constantly contested and affirmed. The reality of any institution grows out of these daily negotiations and agreements. In thinking about how to redesign existing Navy ships and preparing to design the next generation of ships we also have to design the meanings these ships will have for future sailors. The future does not simply occur; it's invented.

### Why Bother With Other Institutions

The expertise of the Environmental Resources Management Team is not centered in an understanding of the Navy as a functioning organization. But as an institutionalized organization the Navy is affected by and affects the society in ways that are similar to other organizations. Given our backgrounds, we have tried to assist in the attempts of organizations to deal with new situations, particularly through the design and management of their environments. In the process we have developed a track record of learning to understand organizations rapidly. We have studied and evolved principles for the working of institutions within our societal context. We have gained some knowledge of the ways in which contexts are changed and can be created through the interaction of society. In particular,

One seldom learns from analogies, but they often start us thinking about something else in a new way.

we have explored the ways by which habits-of-mind shape how things are viewed and acted upon. As the other side of perception we have come to recognize the importance of the organization's presentation of itself in establishing its institutional character. This character is critical in recruiting members who can contribute to the organization's presentation and participate in the development of an attractive personality for the institution as a whole.

To summarize, we have gathered some knowledge of a variety of means for organizations to undertake positive change. We have seen the need to pursue changes that are expressed as a function of the internal workings of the organization rather than introduce changes through acceptance by the organization of externally defined directions for change. This means enabling organizations to create versions of reality that permit them a more potent role in effecting changes in the societal context rather than running passively behind--trying to catch up--as change occurs and comes to be interpreted by the organization. Both social and physical environment acts as the facilitator of these processes and a symbol of their having taken place. One can derive models for creating high performance environments to support organizational effectiveness from a wide variety of settings.

Richard Farson's Axiom:  
Everything works initially; nothing  
works repeatedly.

#### Institutional Survival in Contextual Change

Effecting improvements would be very much easier if the recommended measures would be judged in a context that was the same as the one used by the designer. But societal transformations are so rapid that institutional survival has come to depend on an institution's capacity to manage the process of accommodating their new employees, clients and "missions."

The changing contextual situation does not merely affect the Navy. It affects all major institutions in our society. For

example, churches have been forced to look for new missions. St. John the Divine in New York is no longer going to be simply "a cathedral." In addition it has come to be a local and even national, center for the performing arts. This entails a substantially broadened view of the kinds of activities that are related to man's spiritual growth and a more vital celebration of his aspirations toward the future. Feeding the poor, educating youth and adults, caring for senior citizens, and counseling and guidance services are other functions which churches, synagogues, and other religious organizations have added to their "mission" to stay relevant to their constituents and provide ongoing evidence of their spiritual intentions.

Yea, a man may say, Thou hast faith,  
and I have works; shew me thy faith  
without thy works and I will shew  
thee my faith by works.

EPISTLE OF ST. JAMES 2:18

The requirement to evidence an institution's underlying premises and purposes is not confined to churches demonstrating their faith. Reaffirming ancient principles in fresh actions is also vital to the Navy's continued robustness as an institution. Each Navy organization takes its clues for action and effectiveness from the particular thematic concepts that are currently vital. The organization's work is to devise fresh activities and achievements to affirm the current themes.

Another institutional analogy with the Navy can be drawn with educational institutions, particularly those in higher education. Universities and colleges have been reexamining their missions in response to change in the contextual factors which govern their survival and continuing effectiveness. First, as more baccalaureate and graduate degrees are awarded, the need for education to these certified standards is less clear and demonstrable in the employment marketplace. The rationale of employment as the reason for education has thus been

If people were shown a preview of college life made by taking a random 10 minutes out of every month for four years, few would be sold. Likely, few would even recognize it as having anything to do with higher education or a special institution.

weakened. At the same time, entering students having heard of employment difficulties and those involved in mid-career shifts caused by dislocations in the match of economic opportunities and technical preparation seek both new professional and vocational oriented offerings in the curriculum. The return of older students and increase in number of women at the graduate level are further eroding the scarcity value in the marketplace for advanced university degrees. Looking for a discriminating criterion for choice has increased employer's emphasis on context-specific experience and past performance to competitively evaluate candidates for jobs.

What may be the future for proprietary naval forces?

The growth of proprietary schools beyond the basic level, such as schools for law, real estate, computer programming, and para-medical professions along with the expansion of publically supported junior colleges -- has both exalted and eroded the traditional role of the university. Internally, changes in promotion standards and criteria from peer recognition and publication to student satisfaction and teaching performance (increasingly measured objectively) are all having their impacts on the nature of the university as an institution and its routes to survival. Horizontal entry for older enlistees, continuing inflation's effect on the attractiveness of retirement programs, and exiting to attractive alternative employments by the most qualified personnel are parallel problems in the Navy.

In parallel with the Navy, both churches and institutions of higher education are having increasing problems with recruiting -- promise them anything, but give them the tried-and-true is no longer working effectively. Both word-of-mouth channels and the national media convey to the to-be-initiated continuing reassessments of the match between experience and expectations. It seems that many organizations are beginning to learn that the expectations of youth (who are the ones



largely attracted to these institutions, or the market to which these institutions tailored their offerings) are actually unformed, developing adults. Therefore, the stated preferences of youth are unreliable as a basis for development of effective programs. One has to listen for the underlying unfulfilled ambitions and cogently package the experience to be offered. Instead of giving them what they want, it may be necessary to help them define what they will want in the future. For example, Redlands University founded Johnson College expressly to explore what a contemporary education was. This requires a lot more anticipation of societal development opportunities and an active effort to incorporate this forecasting style into the organizational structure and programs of institutions which expect to survive. Continued organizational effectiveness in a context of change cannot be pasted on. It requires work. It involves risk. It is a verb--what we're doing, not what we've done.

Organizations, too, have "mid-career crises."

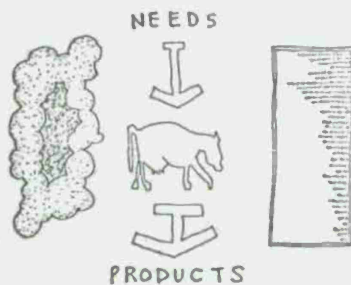
### Introducing: The Perfect World

While one might design the perfect ship, with perfect dimensions, lighting conditions, sound insulation, coloration, and access (based on ergonomic and human factors research) there is no guarantee that this attention and thoughtfulness will not come to be thought of as conspiracy to produce a sterile, inflexible, even stultifying environment. By way of analogy, take the Victorian parks with winding garden paths in many of our modern cities. They have changed meaning due to crime. Winding paths through the woods once called up calming, pastoral feelings. These same walks are now perceived as a "death-trap"--taking people away from the security of the public street. Likewise, a ship which meets all the extant criteria for function and habitability may just as likely be interpreted as a sign of insidious paternalism as a symbol of care and concern.

If I were founding a university, I would found first a smoking room; then when I had a little more money in hand, I would found a dormitory; then after that, if I still had more money that I couldn't use, I would hire a professor and get some textbooks.

STEPHEN BUTLER LEACOCK

There are many serious examples of the failure of designers to understand the role they play in shaping the meanings environments have for their users. Typically, designers are mystified when users are dissatisfied. This, after they've attempted to incorporate as much of the accumulated data about human requirements as possible. The point is perhaps best related by a borrowed example about modern livestock management--that is creating high yield, green revolution, environments for maximizing production. In this instance, a rich grazing environment was to be created for cattle. As a basis for the design all that was known about the taste choices, color preferences, and space requirements for cows was collected. The designers attempted to provide ideal nutritional elements for the cow. They really worked hard on pasturing. Mixing the varieties to achieve successive availabilities of a balanced feed. They virtually forgot about the cows. Cows just merely ate grass and either produced lots of milk or grew rapidly for slaughter. Cattle were viewed as if they were merely windings for meat and processors for milk. And so you had all of the cows evident needs for pasture provided for them to produce products. Agronomists succeeded in inventing what they thought was "cow heaven."



So what happened when they put the cows in the pasture? The cows kept constantly breaking out. They would go down to the

bottoms and edges and eat the scruffy sun-baked grass down there even though they were not supposed to like it or be there. The cows broke out and ate the grass and even some gravel along the roads. Vigilance was increased and the cows came to be virtually "poisoned" on the perfect environment. After some study, it was found that cows had socially defined habits that affected their grazing patterns that needed to continually be paid attention to and the scrub grass and miscellaneous stuff they ate contributed still un-understood (except by cows) dietary elements.

The analogy is that attempts to design functional environments for people which would be defined objectively as the perfect work-play environment doesn't necessarily produce the kinds of results we seek or that we anticipate. Usually it's like cow heaven. It gets the main points, but misses the mini-essentials that would make the effort successful and worth the cost. In such a sharply drawn example the point is probably overstated. But the majority of the attempts to produce more effective and habitable environments for people have been narrowly prescriptive. This insures that the project falls short at least by our lack of knowledge. On the other hand, a more developmental-incremental-interactive approach to environmental design have usually had positive impacts well beyond their immediate objectives. Further, such projects set the stage for a continuing environmental adaptation which can permit the organization to shape change and play an active role in negotiating its future.

Progress is best digested in bit-sized chunks.



## MISSIONS AND THE NAVY'S FUTURE

"What's going on?" and "what's happening?" are likely America's most frequently heard inquiries about the state of the environments. Environmental art is vernacularly referred to as a happening. Though differentiation between the stage and the play, the scene and the action, is analytically quite clear; as an experience, the intentions and doings powerfully shape and color their settings. Return and resee a place you shared with a new love. Go again to the place of your first job. Time and personal development have changed them some, but likely the most powerful transformations are in the "mission"--from anxious neophyte embarking on a new experience to curious adult confirming one's past. While this example may seem trivial, the point is important. The stories about what's going on that the inhabitants of a ship tell themselves, the "why I'm here's," if you will, have a major impact on the ship's habitability. Several times in the conference it was mentioned that there were few environmental complaints during dangerous, taxing, stressful missions. Readiness is the big producer of complaints. Adding relevant, interesting, useful missions might produce more in "habitability improvement" even than in additional physical changes. It seems worth looking into.

The environment, like faith is seen through action.

### Possibilities

Some of the mission areas that might be appropriate for exploration are:

- testing and development of new sea-based technologies
- aquaculture experiments and demonstrations
- supervision of mining and manufacturing at sea

providing brief, intensive technical assistance abroad--particularly by a ship's crew working together in a different setting.



The whole Navy has to think through these possibilities in some manner. This thinking has conventionally been top down --but it needn't be. There are many things, some not even related to the sea, that the Navy can do in the form of new missions, and augmenting present missions. The Navy needs these new missions to shape its image, produce more social credits, justify budget outlays in proportion to changing defense needs. Rather than being at the whim of external threat, the Navy would do well to develop other scenarios which reflect the transformations in military and industrial priorities which will emerge in the future.

For example, there is likely to develop a need for policing "jurisdictions" at sea, supervising major mining and manufacturing activities at sea, and the possibility of seaborne sovereignties. Any serious inquiry could produce a list of many others. In some sense these are awesome additions to current mission requirements. Potential missions provide a wealth of new opportunities to insure quality staffing for the future. They offer an attractive blend of militarily significant and socially productive activities which we can expect future recruits to be looking for.

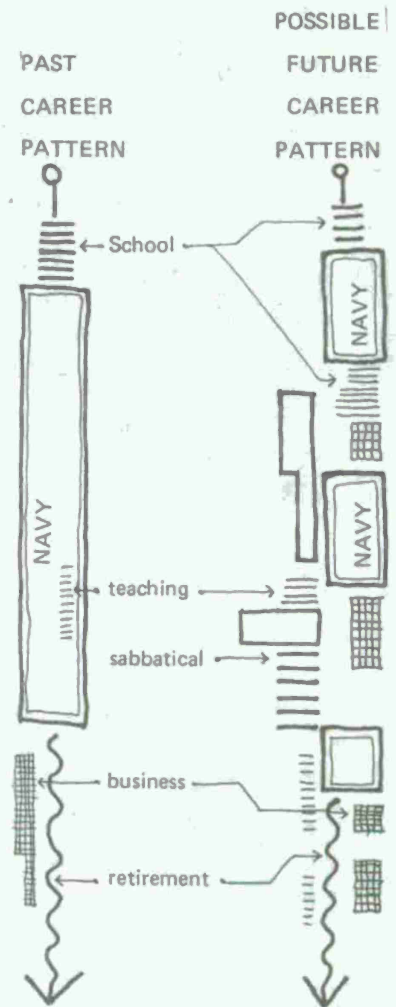
You recognize that the future of the Navy isn't guaranteed--that its future missions aren't certain. Talking about say twenty years hence how will people define and describe what they're doing when they are in the Navy. You realize if different sets of people were asked to think about what the future of naval activities at sea would be, that they would come up with altogether different concepts about what the Navy might be about--how it might relate to our foreign policy, to our domestic policy, to our economic need to export more goods and services, the possibilities of redistributing our educated population to other nations of the world, and a host of things.

## Navy Careers

All of the possibilities described above would make compelling myths out of which better lives might be constructed. One notion is that people might spend a certain part of their career in the Navy. This might be in a block of six years or several blocks of three. They would acquire a set of skills and a web of relationships to other people so that the next step in their careers might be more certain or have greater opportunity. Individuals selecting such "disjunctive" enlistments would have contracts with performance bonds to assure their availability or to compensate the Navy. This device would permit careers to be put together in very interesting ways. Such possibilities could attract people to still leave the farms of the midwest where opportunities for doing something with one's life are very scarce. Going into the Navy for a few years--discovering who you are and what opportunities exist. Have a chance to sample some of those opportunities over a six or eight year period. Then, come back, possibly getting some more education in a formal sense. Next be able to operate a high technology engineering works in Indonesia. Ready to accept a middle-level management job with advancement possibilities in Peru. Or, be equipped to go on a mission to outfit a new kind of aluminum processor to be constructed in the middle of the Atlantic. There are many other variations.

What we're really saying is that the Navy needs both some new myths and some new pieces out of people's lives. We talked a little bit about lateral entry. It may be that everybody the Navy needs can't be recruited and developed out of young people. The Navy may need people to come in at age 30, age 40, and even beyond age 50 to perform particular kinds of roles.

In fact, the Navy might very well perform a service to society by providing adequate involvements for retired persons. More



and more often there is reason to question what utility does the category "retired persons" still serve. These experienced people might be the best to staff facilities both at sea and around the world.

What these new myths about what's happening in the Navy might be is yet to be invented. What is necessary is to begin to think them up. Having a context with possibilities will support the redefinition of the Navy's mission and its long-term effectiveness.

We might remember that the Navy has been in support of NASA on recovery of space missions. What is this area going to be like in the future? I'm sure if we did an "inventory" the Navy presently does a lot of "other" things. Is what is, all that is to be? There are many contextual factors precipitating the dividing up of jurisdiction at sea and the policing of these jurisdictions when they are created and the related problems of sovereignty and manufacturing at sea. For example, will there be little private navies growing up to protect sizeable investments in processing plants that may be built at sea as a strategy by multi-national corporations to avoid the problems of taxation, land-based political takeovers of their resources, while enhancing their ability to selectively attract workers, and to protect themselves from damage and violence.

Something is going to happen. The Navy will respond. It's difficult to get the Navy to anticipate things. These people think that their tasks are very clearly defined. They also believe, very sincerely, that the first time they begin to think this way, that they're going to be out of a job. They have a stake in the baliwicks they're defined and have difficulty imagining their competence being used in any other way. So, if new things are taken on, it will probably mean new sections, new people. That's always more expensive.

"Can do" is very much needed in the development and utilization of the sea—this can be provided by the Navy or by others.

## Charting as a Future

It seems it would be useful to develop a function for the U. S. Navy that would be normal peacetime function which serves the Navy, but which would serve the whole maritime world as well. One such function might be to complete, rather continue, the job of charting properly the ocean and navigation routes. A recent article contended that the majority of the charts used for navigation, be it the Russian Navy, the American Navy, the merchantman or the small-time sailor, were produced before the turn of the century. There are dozens of instances per year among the American and Russian navies and merchant ships of all the nations of the world cracking ships up on uncharted rocks.

In particular, the sea is mostly unknown.

Supposedly, the Coast and Geodetic Survey does this. But, they've mostly announced that they do it. Other agencies also have a role, but the job's not getting done.

In New Yorker a couple of weeks ago there was a super tanker story. We (the world) are building larger and larger tankers. If a tanker stacks up on a big rock somewhere that is uncharted because neither the Russians or the Americans have 'it, perhaps we'll have a giant mess. This is not a remote possibility. And there are hundreds of little mess-ups that cost a few lives.

What does this have to do with habitability? Well, suppose there were a room designated on the ship where everyone who was off duty could go. Say it was a charting room. You don't even have to "staff" it in the usual sense because there are plenty of surplus people who are off duty who would volunteer to do it if they were motivated, rewarded, and got some kind of public recognition. If this were put together right, and there were a little space allocated for it, and because it would be an official mission of the Navy to chart the sea, a variety of the off duty people could gather there to become a coterie for

There's a lot more to surveying the sea than charting its contours—there are ecosystems, minerals . . .

of charting the sea. Obviously they would also mischart the seas--not intentionally, but correctably. In this way there would be a lore developed about charting the seas--called The Inchcape Rock by Robert Southey. It would change the whole scope of what there is to do and what's happening on ships.

### The Problem With Problems

Trying to create a good environment from remedying inadequacies is like stringing together a few pop tunes and then creating a symphony by correcting the deficiencies.

The Navy seems to be largely following the paradigm of identifying problems, make lists of deficiencies, and then correcting these deficiencies. Increasingly, deficiencies are identified not by line officers with broad operating responsibilities for the general effectiveness of the ship, but are items noted by specialists from the outside. These are then given to the line and direct staff operating officers for correction. This procedure makes the situation less and less under the control of the immediate local supervisor. What is done is less and less responsive to his intuitive definition of priorities and assessment of what needs to be done. More and more it is his job to fulfill requirements laid on him by higher commands and by a whole variety of staff specialists.

Another way to identify situations or cases that require attention is to look for situations where opportunities for improvement are present. Rather than identifying these as problems or defects in terms of the present working of the ship, it might be better to look at them as situations where orders of magnitude, if not substantial improvement might be affected. Since it seems there are always more things that need fixing than can be done its important to have a separate "opportunities" list which has to be at least minimally attended to: e. g. for every four "fixes," one opportunity area is pursued.

This approach would encourage the cognizant commanders at various levels to look at improvement not as ways to do better things that we are already doing, but to look at and be able



to effectively demonstrate to their own benefit, the introduction of both new ways to do things and new things to do.

It is fortunate that the Navy command has to some extent resisted successfully the introduction of Tayloresque methods of scientific management. Commanders have fended these principles off by their superior assessment of the needs of their personnel and their ability to organize men for effective action under conditions of battle. The more flexible and holistic military management style which still predominates in small units and divisions of ships is in fact a resource for producing new definitions of the possible--new "can do"s. This capacity for on the scene invention and elaboration of missions is more valuable than the suggestion box route to introducing improvements because with the idea comes an example.

#### Why Make Improvements?

Finding a better way is part of our national heritage. Our country was founded by individuals seeking a better way and seeking a place in which to work out and explicate their better ways. Making improvements offers an immediate source of satisfaction while maintaining a readiness posture when there are no tangible external forces that would allow some definition of competence to be demonstrated.

In the time of battle, anything that gets you through it is okay. One is not concerned at the time of battle with introducing improvements or in doing a thing in the most expeditious fashion with the highest cost effectiveness. One is merely concerned with getting the job done in any way possible with the least expenditure of resources and if possible the maintenance of an adequate reserve. In short, survival.

When "crunch" conditions are not prevailing, it is more difficult to maintain the interest and motivation of an organization.

It is then that dummy or surrogate goals might be introduced to motivate and retain the interest of the organization.

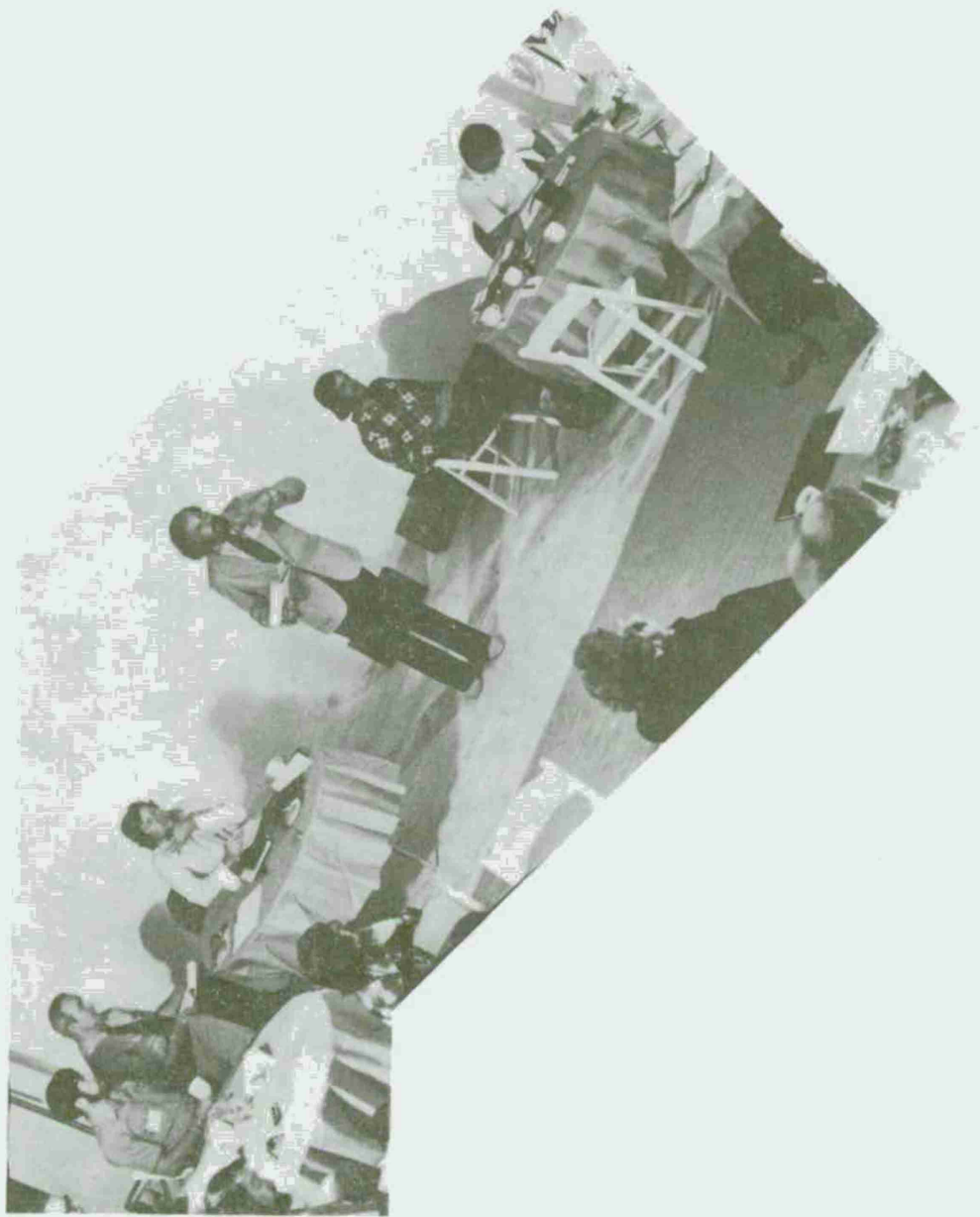
One of these stand-in objectives is continued improvement. It also provides a basis for dispensing rewards. The present suggestion program of the Navy does dispense rewards, and it is highly device-oriented and generic. This program might be broadened to include social inventions and to encourage group submissions that demonstrate the suggestion's utility. Subjects might include better ways of dividing up work and changing the regimens of ship life so that the crew would be either more effective or motivated to perform. New social and physical inventions or technologies might be evaluated in readiness training tests and by the performance of ships on training exercises and missions. It has been noted that the technology transfer possibilities between naval ships is limited. That is, Ship A-1 is not very comparable with other ships even of type A, like A-2, A-3 and A-4 because each has unique properties developed over time. However, there is still the possibility of comparing one's ship with its own past performance. There are less than 500 active Navy ships and each ship represents a substantial operating cost and investment, so that improved effectiveness in even one instance is significant. In fact the best approach may be to proceed with more idiosyncratic development programs to produce improvements.

In some ways urban planners have a great deal to learn from viewing the past achievements of shipboard life as a model for a 24-hour society. Many urban planners have now dedicated themselves to designing systems which will be operative over a longer span of the day and night--both for reasons of making more efficient use of limited number of facilities due to scarce resources and a strained economy. This is especially true in the transportation area where efforts to stagger work hours to eliminate many of the peaking jams in the movement systems.

Unleash Yankee ingenuity.

A second reason for urban planners concern with 24-hour systems is to provide increased "natural" surveillance. The presence of large numbers of people around the city at different times of the day and night can reduce the fear of crime and the risk of vandalism.

International surveys demonstrate an attachment to a highly rigorous regular cultural definition of the day and week. The Navy may be able to tell us, through their experience in operating 24-hour societies, just how negotiable the temporal character of activity in contemporary cities might be. For example, how readily a person can be expected to adapt to work that starts at 3 a.m. and ends at 11 a.m. Whether people can work in shorter concentrated shifts through more intensive periods leaving large areas of time available for free activity during the course of the week or month. Whether people can eat their meals and perform other personal functions at odd hours during the day or night and whether special opportunities exist which have not yet been utilized for urban systems. The naval ship is in this sense a research setting not restricted to the normal form of the work cycle, home cycle, family cycle, and leisure and recreation cycle. This presents an opportunity to invent and to test new arrangements for work and living, potentially useful not only aboard ship but ashore, not only in the Navy but in society at large.





Life is like playing a violin solo in public and learning the instrument as one goes on.

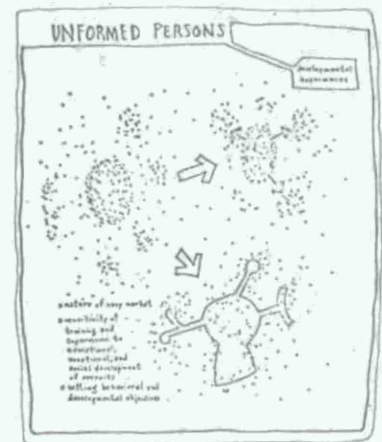
SAMUEL BUTLER

## LIVES AND SHIPBOARD LIFE

It's not only in beer commercials that you only go around once. The media assisted access we enjoy in this country to all of the myriad possible choices about what to be, wear, do, look, dream, try . . . produces a crisis of choice. Particularly for young people--but for all of us. There's not time for everything--even if we do several things at once. Recall the image of teenager doing home work, watching TV, eating an apple, listening to radio, and talking with friends. This may be the biggest dilemma of shipboard life in the last quarter of this century--to build in some action.

For many in the Navy there's too much action on ships already. Much of it is not only counter-productive from an official Navy point of view, but is likely harmful to the individual's development--and many sailors are not yet fully developed as persons. As with the "environmental problem" of the light bulb filament, it may be easier to displace what is there, in this case air, with an inert gas than to try to pull a vacuum. On several occasions we heard that sailors only ate and slept when they were off duty and not on watch. I guess this is considered best. But getting with their lives motivates a search. We suggest it's better to provide an opportunity-rich environment with many potential pursuits instead of trying to fill a vacuum. To be sure, the pursuits will have to have legitimate attractiveness to sustain interest. If you try to sell "ha ha" activities like arts, crafts, and libraries; the chances are nil. Some areas that might be fruitful for the development of a new class of shipboard activities include:

- exploratory activities which allow for personal interest and identity development
- preparation for and participation in cross-cultural experiences
- special assistance to define and carry out self-initiated projects and adventures





### Discovering What Life Can Be About

While no one is in charge of anyone else's life (at least in this country), there are only a limited number of story-lines or conceptions of possible things to do in life, circulating and current at any one time. We do have more than the "button lineup" of rich man, poor man, beggar man, thief, doctor, lawyer, Indian Chief. But there is not an infinite variety. You don't find a Confucian scholar emerging spontaneously in Northern Alabama in 1974. Each culture, each setting suggests a finite set of objectives, justifications, and accounts out of which we fashion our own personal careers and style. To some extent, these "stories" are invented. The producers of Navy films package what they believe to be current appeals to portray for the recruit a conception of what he can expect to achieve as a result of Navy life.

In discussing the issue of "lives," trade-offs are involved the same as any capital investment program. An institution can not be all things to all people. Also you can't just say anything. No institution will survive for very long if it makes unwarranted and false claims. Therefore, it is important to make a critical appraisal of which benefits, features of daily life, training offerings, and adventures that exist and might be used to represent the complex potential meaning of the Navy to its existing and potential members. Increasingly, the competition for manpower will require a combination of vertical and horizontal opportunities. The marketing adage: "With so many different kinds, one must be right," still works. Career offerings might range from short task-directed tours of duty to complex long-term commitments. Properly packaged and targeted at specific market segments, Navy duty could compete in potential for fulfillment with the opportunities for self-actualization which exist in civilian life.

most corporate "image" advertising is directed at present employees, not customers.

### Join the Navy and . . . ?

The time-lag on disaffection with contemporary institutions is rather long. Many develop strong traditions and survival hedges over a long time-span. Indeed, an industry may go on for some years without recognizing the small signs of

disaffection. One day they find they're on the verge of a critical breakdown due to the small, subtle deficiencies in the performance of individual employees.

Even if widescale experiments in modifications in shipboard life are not merited at this time. It is important as a hedge to experiment with the countermeasures which will be needed in the future. Reinstatement of the draft may not be only politically difficult, but may have side-effects in the meaning that it gives to national service that it would create worse problems than it solves. Ten new screw-ups may require two people to watch them to do the work of one motivated person. It is likely that the Navy will sometime face a manpower crisis in competition with other available careers, particularly for certain kinds of skills. Difficulties are even more probable in securing personnel who have higher education and advanced training and critical experience.

The reinstitution of the draft may produce more harm than good.

More innovative and aggressive approaches to personnel utilization will likely pave the way for jobs to be occupied by personnel not currently suitable for recruitment. This group might include, for example, second-career professionals, women with technical education, minority executives in manufacturing and communications.

While women may not become a normal part of the complement of a fighting ship in the immediate or even remote future, the experiments which have been performed with co-ed crews have been important. They reveal to Navy personnel some of the "organizational properties" of existing ships which they might not otherwise be aware of because of the assumptions that are embedded in the complex traditions which the Navy has created through the years. Once these traditions are embedded in normal practices it becomes difficult to trace the source of resistance to change. Everyone involved with the performance of ships assumes these traditions to be essential to the identity of the Navy. In fact, most traditions were ad hoc even accidental inventions, originally meant to only solve a specific problem.

## Why Me?

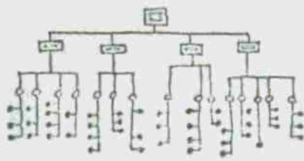
A major question was raised about whether the whole conception of the individual within a flexible organizational structure is applicable to the Navy. Specifically, it is often true that special skills or services are noted on the sailor's records. However, these notations are not diligently amassed. Further they are not made in a fashion, for enough specialties, and with sufficient precision to be regularly used--it's easier to ask around. Also, the sailors are not encouraged to see them as part of the process of aggregating skills and experiences leading ultimately to new assignments in which the sailors share to a large extent the responsibility for bidding for and for deciding about what their new assignments might be. Therefore, career objectives of sailors are largely left to formal job qualifications--which increasingly are arbitrary--and the whim of accidental recognition of the various unique and special "surplus skills" they have likely been accumulating. Often a sailor is at the mercy of the social impression that his evaluator, be he the chief or the division officer, has of him.

It is conceivable that the Navy could function so that sailors could bid both for new assignments, which would take place over a longer period of time, and also for subordinate experiences, which would allow a sailor to have short-term, experimental experiences with tasks to build up their confidence prior to requesting assignment to a new job. Such a dual system would permit selection on the basis of demonstrated proclivity and experienced interest and provide important cross-training to raise personnel responsiveness.

To illustrate: in the university a person may play a small role in a wide variety of research projects. Once a person has demonstrated skill and through experience identified an interest he can take on a more leading role in a very specialized research project. For example, a project to design new admissions procedure for a hospital, based on a wide range of experiences in hospitals from working at the emergency ward for a few weeks to being involved in the drafting and blueprinting of plans for hospital lobbies as well as

### SHIP STAFFING

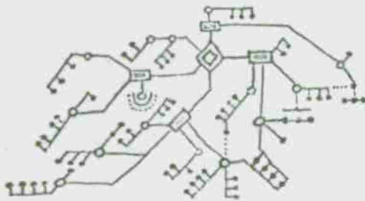
#### Static--Hierarchical Organization



#### TREE

VS

#### Dynamic--Open Organization



#### LATTICE

evaluating real estate sales persons and working on scholarship selection procedures with a faculty committee.

Clearly, the Navy is not organized like the university. Its missions are much more clearly prescribed. Also the ways one evidences ability to perform those missions are based largely on training which is also carefully outlined, prescribed, documented, and ritualized. This procedure, however fair, fails to use the self-recognition of interest, acumen, or past experience to help select one or another sailor who would be especially able to perform a particular task. Further, it gives credibility to the doubts of unique competence and identity which sometime come to all of us.

Everybody needs to have at least one thing that they're tops in.

### Expectations and Experience

It is important to recognize that many advancements in the work environment of the Navy may be precluded for some sailors. This is because the beliefs and attitudes of their superiors is based largely on the fact that the prescriptive nature of the work of these men doesn't allow them to show off alternative skills which they may have ready at hand, they therefore must be dumb, lazy, . . . . There are many psychological studies both in and out of the context of work which now show that the expectations of the supervisor or a teacher play a great rôle in determining what skills a person exhibits and can ultimately claim to have. It turns out, if a teacher thinks children won't be able to read, they have tremendous difficulty in learning how to read. If they are treated as if they are skilled and able to acquire those portions of skill which they don't already have, this optimistic outlook tends to reinforce itself and confirm itself. This expectant attitude sets in motion a process in which individuals simultaneously rise and are lifted to the occasion. Individuals develop skills more quickly than they thought themselves able to.

Charlton R Price  
*New New Directions in the World of Work,*  
Upjohn Research Institute, 1971

There are many instances now in the field of job design which show that positive supervisor expectations coupled with occasions to demonstrate surplus skills produce productivity gains



Robert For, *Motivation Through the Work Itself*, American Management Association, 1969.

Viable groups are held together by the separate competences and relationships they have and maintain.

and increase organization effectiveness. One example: AT&T now has trained more than 100,000 of their 1,000,000 employees in a program called "work itself." This program facilitates a considered and worked out redistribution and reallocation of authority. Linemen, information operators, repair and maintenance personnel and other functionaries in a particular locality have had their jobs enriched and elevated by being able to realize on the job new potentials they never thought they possessed. To give you some idea of how it goes, in one case work orders for telephone installation, line repair, and equipment repair had been directed from a central office, down to the local offices, and then out to a specialist. Now work orders are directed from the local offices in a way so that each man is virtually the telephone company agent for a particular set of city blocks. He is known and recognized. He is now responsible for a particular area. This enables him to be the person who installs new phones, repairs them and generally takes care of business. It restricts him spacially to a small service area. As a result he begins to notice things that are awry which no one is yet complaining about. He employs whatever extra skills, perceptions, relationships, knowledge he has to keep things in shape. By scheduling his own work and the sequence in which he will take it on, he is freed up to provide incidental repairs, for example, of a cable box that is wearing out which he now becomes aware of because he is always on the scene. This not only increases pride of workmanship but it increases the scope of tasks which the workman is now able to carry out. Furthermore, it eliminates about three quarters of the paperwork up and down the organizational tree. The next logical step will be to allow bidding for increased service areas for more compensation to those repairmen with outstanding performance records. This could begin to markedly increase productivity and reduce costs while contributing to better service. This and similar approaches may help AT&T deal with their future which begins with their own Robert Ford's observation, "We have run out of dumb people to do these dumb jobs."



## Negotiating Ships' Environments

Lawanowski: It's hard to set a boundary between work life and life on the ship generally. Everything on the ship when it's at sea is done in a particular way in a particular place. It seems much more controlled than civilian life. So the question is what do I know as a designer that can make the environment better to live in. If there are fewer people on the ship, it may be easier to divide up the space, but how that space really gets divided is always a political decision. He doesn't simply go to personnel.

Hotten: The official functions and necessity things may be all specified out, but if you hang around when you're on a ship, there's a lot of activity that isn't part of duty or anything, and some that's not even kosher.

Rand: That may be true, but getting back to what designers can do--they can at least think up and show some alternatives which establish by their existence and the properties they portray what the designer feels the brass, or whoever makes these decisions, should be picking between. While I heartily agree that space allocation and other habitability choices are essential politically the criteria of choice are presented by staff men, or women--in the case of environments, the designer.

Scheele: Ultimately, it's the character of people's lives that indicates what they believe to be important about the environment. If you give them only trivial choices and allow only minor variations, then details will take on great significance. If you'd try once letting a ship's complement figure out from scratch how they'd arrange where to sleep, eat, work, bunk, et cetera, it would be far different from present facilities. Some of it would be unworkable or dangerous, but I'm sure there would be some good ideas, too.

Price: Psychologists, even in prisons, have had to think about what they're doing to people's lives--were they going to shape them up to the prevailing norms and leave the rest for the individuals to do or do they help individuals deal with what the individual believes to be important and proceed that way



THE  
NEGOTIATION  
BEGINS

to achieve minimal competence. I don't think the ship designers should contribute to making improvements on the things they've been directed to improve, if those things only make minor differences. Let's try to find situations for design that have the potential to change the basic character of life at sea and begin there. I know in underground missile silos it was introducing graduate school.

## 24-HOUR SOCIETY

### activity patterns



A decision is the action an executive must take when he has information so incomplete that the answer does not suggest itself.

Arthur William Radford

## THE THOROUGHLY TESTED NEW INVENTION

The hope of management and the bane of innovators is the persistence of the completely checked-out breakthrough as the model for their efforts. Repeated experiences with the "muddling through" process of innovation is somehow discounted in favor of the unsupported ideal: the surprise-free invention. Narrowly construed and unenlightened interpretations of improved management techniques have added to the problem of innovation, especially within large organizations. New management tools have often clarified the need for improvements and at the same time created an organizational climate that stifles innovation.

This has led to a variety of diversionary practices in efforts to produce any innovation at all. One approach is to stipulate the ideal innovation first, and then try to fill in the means for accomplishing the objectives. Besides leading to a lot of frustration and disappointment in attempts to fulfill on such promises, this approach often results in elaborate investigations along narrow lines and a high degree of unintegrated specialization. Another approach employed is to obtain funding for a relatively easily justified and accomplished project and use the surplus efforts to try to produce innovations. If one is unsuccessful no one knows, but more significantly no one knows that there were any attempts and what was learned in the process--even what doesn't work. When one is successful in such a "covered" attempt it reinforces the breakthrough-out-of-the-blue myth, leading to a belief that innovation can't be directly budgeted and managed. If you looked at the reports of the many "evaluation" projects--particularly the recommendations sections--you would find where an organization's innovation attempts are being made.

Environments for improved organizational effectiveness won't come in neat packages.

An elaborate variation of the "covered" innovation approach might be called the constructed-chain programming method. This approach begins by creating a research and development program to produce a breakthrough that fundamentally already exists--but which "requires" extensive verification. The process of verification can be very highly specified--inspiring great management confidence--and additional exploratory efforts can be built into the budget. One then completes "verification" or "testing" or whatever, while searching around for a next invention to add to the chain. Additional testing and more extended verification can cover additional attempts to make a next discovery. This process is sometimes referred to as the magic medical research model.

What all this says is that an organizational climate which directly supports innovation is important to significant discovery. Discoveries will be made, even under the worst of circumstances. And lots of money and other resources will be used in the process, if just to produce pop-throughs instead of breakthroughs. But, there are a lot of other reasons why innovation is difficult to achieve.

#### If Man is so Adaptable, Is There Any Need For Environmental Improvement?

Like other organizations, the Navy lives on its reputation. The Navy's distinction is based to some extent on performing impossible tasks under imposing circumstances. Indeed, from this expectation is distilled the essence of "adventure"; a ship never has all of the space, supplies, and crew it requires to be really ready. Yet the job gets done.

Needed: more chances to overperform.

In the context created by the "myths" of can do, concerns about habitability seem to some officers and enlisted men as insignificant concerns. There is widely held belief in the adaptability of man when faced with great challenges. Most are

persuaded that the healing power of the pride generated through high-performance, peak experiences is a balm for all ills.

Holzbach: Man is terrifically adaptable. In fact, sailors in particular accomplish wonderful things despite awful circumstances. In the most difficult situations, they always seem to come through and do the job. Even against unbelievable odds, they demonstrate their ability to come through when it counts.

Thus man, and sailors in particular, seem to exhibit great adaptability towards their environment and great resourcefulness in getting the job done despite prevailing conditions. This has been observed in many operating conditions. The only thing that can be said is it depends on the existence of great needs for getting things done. Survival itself often has to be threatened to make man perform in these situations. Once involved, their intuitive ability to deal with the factors that shape the situation is great. Especially, if the factors inspiring the situation are under their control.

It is terribly important, and such high performance situations require that "crunch conditions" don't persist forever. That is, there must be an end to them. Further, those involved must somehow be adequately recognized and rewarded at the end. At least, at the time one has to believe that this is so in order to undertake the tremendous efforts that are necessary to overcome in these adverse circumstances.

It is not clear that the rationale for maintaining such an operating environment is any longer applicable in the most high technology, high performance, emergent situations for mission effectiveness in the Navy. For the most part the Navy ship is standing on line in a readiness posture. It acts as a deterrent to threats. What this means is not completely understandable to those who may be present in the situation as

Efforts to produce capacities for effectiveness peaks may now need to be shifted to creating effectiveness plateaus for the modern Navy.



it's occurring. It is not clear that what they do is immediately appreciated, nor that the rewards will be equitably distributed to those who maintain the best vigilance in such circumstances.

It is true that anything to improve things would probably be appreciated by most sailors. And, if things are improved, they will still provide when called on tremendous efforts in certain circumstances, in difficult situations. Yet, there are a lot of situations that one can imagine, a lot of scenarios of battle where giving one's all may not be enough. More and more in modern critical performance situations, being a charged-up team and operating effectively for 24 or 48 hours may not spell the difference between success and failure. It is chiefly because we can expect the characteristics of battle and characteristics of the missions to be so different that the Navy may have to contemplate operational environments which are far different from those that have been good enough in the past.

#### Dumb, Proud, Expectant

Gloye: I'd like to tell us some more sea stories. Men aboard ship are doing technical work. In peacetime, it is very apparent that when they can, they would like to take pride in their job. You can see this for example, in watching an aircraft carrier get planes off and cover them, especially when all the gear is not operating at optimal levels. Human endeavor makes up for the difference. Pride in being able to do that job, for instance, could be noted by the amount of success in Viet Nam, where the duration was more extended than in any war, with a greater number of missions, and using old ships. A man might not like his living environment on a ship, but he can take pride in his work. This wipes out a lot of that--the shortcomings of the place.

Subtle events can cause a person to decide not to re-enlist or to change his whole attitude about the Navy. The American Institute for Research has done a study for ONR related to the all-volunteer force and military manpower planning. They looked at the recruiting operation versus experience on the first tour with the Navy with the view of finding out how better to recruit and what are the decision points on the first tour. They tried to find out how we can influence the right people to stay, and how do we help people who are not really Navy material. It amounts to setting up experiences to be consonant or dissonant.

The Navy has a large turnover, about 70% stay only for one tour. Maybe that's not too bad; you need lots of low-level people. What usually happens is a guy goes to the Recruiting Office with the vague idea in his head that he would like to see the world and have adventures on ship. He perhaps sees the Navy as a chance to upgrade himself. Therefore, you attract more blacks and others from economically depressed areas. However, we still have a lot of high technical jobs, and there is good training available to deal with these jobs, it is not completely distorted.

The recruiters who are successful learn how to be non-directive therapists. They find out what the person wants, and they say, that's exactly what you'll get in the Navy. That is, if he has decided the guy is a good type and will make a good recruit. The researchers listened in on the social interaction between the good recruiters and candidates. A good recruiter is one who moves a lot of bodies in the door, and meets his weekly quota. The expectations created may be very different from what is actually experienced when people get into the Navy and these promises are not kept.

### Labeling--An Innovation Retardant

Boot camp actually results in very high morale. There's a lot of togetherness because people are subjected to authoritarian conditions. Punishment is in evidence and a lot of pure solidarity develops in the midst of this authoritarian environment.

For some blacks, this experience of group solidarity and peer support is the first that they had in their lives. But after boot camp, these peer groups are dispersed. Some go to Class A schools. Others who are signed up for only 3 years and have to have the 4th to have the opportunity to go to a school or don't qualify for a school, get assigned directly to the fleet. The A school graduates know they have a career ladder. They also know they can use the training they're getting in civilian life. When they go to a ship after A school, they have status. By in large good things happen to them.

The past, rather than performance in present opportunities, determines too much of the sailor's future.

About 40% of a crew may not have been to Navy school. They are viewed essentially as an unskilled labor force. They chip paint and do other menial jobs. They are moved around between those jobs. But almost all the jobs have no status, no career ladder, and in no way lead to other training opportunities.

These people get very disillusioned. They can see that the promises that were made to them in recruiting won't be fulfilled. Two months after they are in, they decide to get out. So we end up with a sizable portion of a crew ready to tear down everything. They are dead weight in the crew--and one not in anyway in the spirit of things. Blacks are often in this position. They do live together on the ship because of the work assignments not because of racial discrimination. That's how work gets together with habitability.

Calloway: This is the phenomenon of the dummy school now. People get stigmatized if they don't go to an A school. While

their A school buddies from Boot Camp are going off and seeing their girls, and having leave, they have to go directly to the fleet. They have no leave, no status, and though they graduated at the same time, they have to cow-tow to the people who have the A school status.

The terrible thing about this is that the people start believing stories about themselves that are communicated to them by the way they are assigned and the way the status system works. Relative deprivation, you might say. The question is not one's absolute status, but the comparison of one's status or situation with that of others.

Rand: The new technology for doing standard jobs such as maintenance and routine ship operations opens up new opportunities for habitability and new social arrangements. It's likely that when the work scene aboard a ship is not going well, the habitability issues come sharper into focus and cause more trouble. In other words, if the work morale is high, a less favorable environment for living can be tolerated, or even ignored.

#### How It Is That Change is Gone About in the Navy

Generally people agree that habitability expenditures are way down on the list of pending modifications to the ship. Partly this is due to practical concerns. A ship comes into port for a short (say four weeks) availability and places its orders for improvements. By the time these changes are approved, the materials checked and ordered, and a public advertisement placed according to regulations to award the job to the lowest bidder,\* the four weeks have been virtually used up. Fittings that once used to be put in place at foreign ports now cost as much as American products and labor, and therefore are more difficult to bootleg out of small special budgets.

Only if I have to

These are not insurmountable problems by any means. For example, it would be possible to set up a system wherein orders are placed and bids let before a ship comes to port. The manpower aboard ship would be responsible for drafting these modification, estimate building costs, and prepare plans and so forth. Possibly they'd get some technical assistance. The question is whether there are rewards for this kind of effort? What kinds of policy initiatives or experimental procedures get implemented or passed through? How can the results of these past experiences be used to suggest ways of being more effective in providing technical assistance, and in diffusing the adoption of technical innovation throughout the fleet?

In some respects the Navy is an experiment eating machine; lots of things get experimented with and dropped?

Schwartz: I like our program because Zumwalt says, "reduce the manning of the fleet." So we're going into technology to replace the basic bodies. Therefore, we'd like to plan for recruitment of new kinds of individuals. We calculated the savings. You can sell the financial planners in the Navy better allocations for resources if you have "evidence" of this kind.

Heffron: The chart that was shown before of the Navy as a hierarchy doesn't really reflect how things are. Washington doesn't make all the decisions. Obviously, it is more like a lattice structure. There are lots of pressure from the fleet and change occurs from the line command to other groups in the Navy, but there are lots of competing pressures. Sometimes things get through, and sometimes they don't.

Lawson: If a ship comes in for overhaul, and you take something off a ship that's working and put in a better one that doesn't work; the next time you're going to have a hell of a time getting that commander to make a change--any change.

Many people have to agree that an idea is good if it's going to be acted on.



Maybe the retrofit or maintenance refurbishing of the ship could be done by the ship's crew itself. Rather than everybody getting off the ship and separate people come in to make those changes some of the crew would participate.

Hotten: I went into one wardroom where the officers were busy calling all the lumber companies in town because they had a few hundred dollars to spend for habitability. They were going to work that out themselves, because they didn't want the chiefs to get hold of the money and not use it effectively.

Heffron: It seems like this business of change or design ought to be straightforward, but it is extremely complicated. The budgets are in separate pots of money, so you can't, because of the accounting rules, save money in one place by not spending it in another.

Scheele: Maybe that means that habitability will come down to rearranging the money pots and working out a better way of allocating funds. Business effectiveness, you know, depends on creative accounting.

Environment is accounting.

Heffron: But then you're into Congress, and so forth. Maybe, you can work through Congress because the ratio of special bills to general bills is always much greater. A Congressman can get interested in something very specific. We need to find out what the point of entre is. Once you've created that pipe and greased it, you can put other things through it.

Lawson: The C. O. of a Navy ship really has a lot of autonomy. The command and the officers on a ship can interpret responsibility themselves, what they will do with the time and funds available. They will take risks, because they have the ultimate power to decide what's going to happen. If a commander doesn't feel that something that is recommended that he do, or even that he's ordered to do, will improve the operational status of his ship; it won't get done. He'll find a thousand reasons not to do it. This is because the C. O. and the staff

If environment can be seen by captains as being important to the ship's effectiveness, how hard their job is and the rating they receive and they think there's something they can do about it, then the environment will receive attention.

Effective ship environments don't need any frills.

have a lot of autonomy. They have the ultimate responsibility. This means convincing a specific commander that something is going to be done on his ship that will be in his interest. It's because of this independence that you have so much variability in how ships are within a given class.

Some of the myths in social science don't hold too well. For instance, you may have a Captain who is very concerned with the crew's welfare. And, he does visible things to help people on the ship. He's interested in the quality of the crew's life and morale, and improvises a lot. That could be a good crew. Then you have another crew on another ship where the commander is an autocrat by the book, no frills, real Navy. And, morale may be just as high in both groups. Some guys like each kind of management climate.

Habitability is not a certain color or a particular furnishing but maybe a process--a process of trying and finding out as one goes along.

So what we have here is an argument for different styles of habitability.

There may be a small event in the life of the ship which can serve as an occasion for salutary change without chaos or conflict. So rather than talk in general, it would be good to get back to some specific elements of living aboard ship and specific situations that occur. Are the anecdotes or suggested changes we may come up with sensible?

Schwartz: There really are two approaches:

Number one, educating the Navy management and the reserve system through some type of cooperation between the crews of the fleet and social scientists about way in which we can make an impact through design on the lives of people in the Navy.

Number two, another and equally fascinating long-term task

would be to address some of the practical problems which have implications for real issues in the Navy, such as recruitment, selection, retention, job effectiveness. To make up operational definitions of the impact of these elements of the whole ship's functioning in regard to its missions.

There are many problems. Crews and command rotate and have power struggles and changing priorities. There is a cyclical emphasis on environmental issues in the Navy--look at the bulletins and research reports of 1950's. Some of the things we brought up then are still not dealt with. The Navy has arrived at some very primitive solutions, but they are still quite primitive despite a huge time and effort that has been addressed to environmental design. The question is how can this kind of difficulty in change be interrupted. How can you break the cycle?

Maybe one works with the population or group you're trying to make changes for and reports the specific changes you've suggested as a result of research on the specific context. For example, we do see if there is a problem of recruitment, there is a need to reduce manpower aboard ship, or you might keep the same level of staffing and invent new functions with more varied performances that would be done with the same people.

Improved accomplishment of routine maintenance aboard ship is certainly an issue. Here is a place where a lot of experiments can be done and improvements made. But, aboard any particular ship you may go against the Navy tradition as interpreted by that ship. You come up with a fantastic solution, but a commander has his own priorities, and your well worked out scheme goes to the bottom of his list. Messing, the laundry, and preventive maintenance among routine activities and damage control and battle stations staffing among the contingency conditions seem to affect the manning requirements and

One thing we're sure of if more effective ship environments were easy to invent, they would have already been invented.

the socially constructed meanings most significantly. Effecting an improvement on one dimension of organizational effectiveness doesn't necessarily lead to an overall improvement in the system. Strategically it would seem that small-scale experiments and situationally-occasioned improvizations could be sources, not only of local learning, but of wisdom for more general application. Justifying the actual trying of something new will likely be the most critical element in effecting improvements in the shipboard environment. It may be some time before the normal environment of ships is seen as producing innovations and improvements as a normal product of its operation. But an innovative environment seems possible.

## PROJECT CONSTRUCTION

Ideas won't keep. Something has to be done about them.

Alfred North Whitehead

Projects are born of ideas out of necessity. From this beginning, however, if they're going to have a significant effect on improving how it is that whatever usually gets done; then the initial concept has to be carefully constructed to become a first instance--a full-blown project. Concepts and situations seldom spontaneously generate a significant project. Often projects are undertaken for purely organizational reasons too, as when there needs to be a job for someone or when there's a situation that something should be done about. But projects undertaken to guide the organization in making genuine and noticeable improvements require thoughtful construction.

There are always a great many factors that might be incorporated, method to use and objectives to be realized in constructing any project. Selecting an appropriate set of relationships to deal with is still largely an art--and in the generic sense more political than technical. Beginning different ways is usually a good strategy. Systems analysis was developed to help focus on critical factors that affect a system's performance--but specifying the performance for a ship's environment under different conditions, missions and time periods is very complex. Perhaps it is beyond our present understanding, and if we consider the changing expectations, specifying environmental performance characteristics may be too cumbersome and interrelated to be useful to undertake.

Systems analysis is not doing everything with great thoroughness and precision, but figuring out what's critical to doing well and focusing attention on that.

Project construction is already a "folk art" in the field of technical development. This art consists largely of seizing on context-embedded opportunities and moving from them, rather than proceeding from abstract and universal definitions of desired performance improvements. For example, a



project might be constructed to examine uses for by-products of specific processes, or to find out how to improve the judgments made by particular professional specialists using a new information resource, or ways to use the capabilities of a certain staff group that ended up after a reorganization with gaps in their workload.

We believe that this opportunity-sensitive approach is a useful one to apply in a series of attempts to improve the performance of the shipboard environments. Some of these opportunity elements are:

- integration of training programs and activities
- additional purposes for annual leave
- job redesign and role elaboration
- improved special educational offerings
- support for avocational interests
- work assignment processes
- trial experiences with vocational alternatives
- develop more elaborate career ladders
- crew initiated recruitment
- participation in assessment--evaluation functions
- conferencing to augment communications
- automation of and aids for regular maintenance activities
- changes in shifts
- personnel multiplexing
- simplification of reports and regulations--more response from those provided
- reallocation of space to activity pattern combinations
- integrated and accessible planning and budgeting

In the absence of detailed and widely agreed upon performance standards for ship environments, there are still useful projects that can be undertaken which are of what might be called opportunity-sensitive in contrast to being goal-directed. Both kinds of projects produce organizational

benefits and improve performance. To construct a goal-directed project requires that goals, usually subgoals, and even more detailed performance criteria be specified. Then one looks for a situation that significantly detracts from overall performance and where improvements might be made. Out of the elements discovered in this abstract process of considering the system, a project is then constructed. On the other hand in the opportunity-sensitive approach some resource, situation, or idea is seized upon and a project constructed out of the elements that link the opportunity with what may be considered improvements in the performance of the system.

Start where you can is often better advice than start where it's best.

The conception of how to get an activity started in the Navy which might lead to improved methods of environmental management was outlined by Scheele:

One aspect is to consider the whole setting in which this environmental improvement would take place. Why be interested in environmental management? There are various versions at any one time of what ought to be done or what environmental management might mean.

One way of instituting change is to develop specific work on a definable, manageable, and delimited task. Then do a number of such projects. Taken together a set of related projects would have cumulative effect and make a difference in at least one shipboard environment in the Navy. For any given project you have a number of choices. These include how you can state the problem, the techniques to be used, and how the results will be evaluated. Pick things for high immediate relevance and that have self-fulfilling validity. This is not to be science. Purity and generalizability are not important. What is sought is things that work well on a particular ship. Learning comes later, improvements first. This is why we've suggested environmental management as an approach.

One tempting model is to do pilot projects. But, a demonstration based on what worked on one ship or even a few ships, will hardly even be specifically applicable. General ideas and concepts will not doubt be applicable over many different kinds of ships but the grapevine and schools can carry information at this level of detail far faster and more effectively.

Besides being a time and resource consuming process, the pilot demonstration implementation approach is tough in other ways. One, is in the passage of time from research to action--from pilot to implementation. The world changes. The Navy takes on a different tact. Between the time an experimental project was started and the results from this demonstration are ready to be instituted, you may find yourself with a successful project that you'd rather not do anything with. "

Generalization comes after investigation.

It's possible that a lot of money will get pushed into this model of "pilot study to demonstration to fleetwide application" for things that really do not reflect priority concerns that the Navy has at the time with the ship involved. Environments might get pushed into this model with unhappy results. Environmental management is a way to use improvement dollars in the production of immediate and recognized improvements. If there is a five-year lead time in ship design, then there is every likelihood that many improvements will be needed even before commissioning.

The Army has now been through several generations of missiles--research, design, deployment, and de-activation. Looking back in hindsight one can say this was very wasteful of dollars and of human lives. There are other goals which might have been accomplished there; in fact, where accomplished, but not emphasized. For instance, several thousand people were educated in electronics, cryogenics, and other skills. Almost more importantly, social competence was gained. Social competence meaning how to get along in life, learning how to play the game, what others will do for what, figuring out what's going on--this could have in part justified the programs.

Projects in environmental improvements probably should relate to issues that are continuing concerns of the Navy--particularly, the all-volunteer Navy. These include recruitment, retention, giving people a sense of self-esteem, morale, productivity, and integrating shipboard life with

shore life. Various techniques might be used for this. For instance one might be pre-Navy experiences for teenagers in what might be called "blue shirt" camps.

### Experimenting for Real

Sometimes research projects themselves can be training grounds. For example, Systems Development Corporation got people together to work out an appropriate organizational model for air defense stations. To do this they ran a behavioral lab in which they designed the organizations operations in a simulated setting. This worked so well they were asked to run all personnel through this lab who were going to be assigned to such air defense stations. The design methods became the training techniques by having men work in a simulated though experimental setting. If they had used the real instead of simulated first air defense station they still would have spontaneously invented new techniques with the first assigned staff if they had treated the exercise in the same experimental and discovery-oriented way.

Life is an experiment.

One strategy for environmental management would be to call the situation a simulation. In this case you'd describe the situation as exploratory--one in which a number of waivers from the normal procedure were going to be tried. Then see what people invent in that situation. It would be surprising if they didn't do new things. Then this knowledge could be taken back to the fleet--but, not in form of "procedures". Rather, promulgate potentially workable ideas and have them tried by others. Adoption would then always be based on fleet experience with what works. Once started, this process should produce lots of local inventions and create responsive and responsible ships.

Learning comes from explaining the differences, but there have to be differences to explain--preferably ones worth explaining.

This would be different than having a huge research structure with researchers observing behavior, writing reports

with the problem of implementation left hanging. It's also different than giving pep talks to the crew on improving life aboard ship.

Another set of experimental projects might use the concept of "irregulars." This is an analogy with the various neighborhood groups who called themselves the so-and-so irregulars. Individuals might be encouraged to volunteer for a ship if you wanted to see if effectiveness and shipboard life could be improved. Given some special incentives and a chance to work out their "act" this unorthodox crew could run through a refresher training course. We understand these are run anyway for all ships and would serve as comparisons. If the irregulars did better, the reasons for that could be looked into for possible wider application and adoption. Experimental situations like the preceding call forth the unused knowledge and know-how possessed by a lot of people (even the dumb heads) that never gets tapped.

In the Army there were Reserve Augmentation Hospitals. These consisted of a broad group of reserve specialists who would augment a cadre of regulars to make a fully operational hospital when needed. A ship might be staffed by a skeletal crew (after automation improvements) to be augmented by reservists (an incentive for better training), or by an air-mobile supplementary crew of regulars. This could even be used to continuously man ships. In the exploratory-experimental mode however, the permanent skeletal crew could make changes with each new augmentation crew that comes in and try different approaches to improving the environment for organizational effectiveness.

Anticipation of and response to transitions are good occasions for change.

In Government the most significant changes are made at the beginning or end of an administration. Thus, the changing of leadership serves to renew the organization and maintain its effectiveness. The tradition is changed. All in all, we need to think of possible techniques to bring about a greater



concern and active involvement with of the ship environment issues other than by the traditional research route of survey instruments and interview clipboards.

### Evaluation as Invention

Another technique is to start with something like an evaluation project which you can do and have access to environments that could be improved. The improvement things that you learn would be extras--a bonus. This is better than setting a high and comprehensive goal only to get wiped out by not being able to achieve it.

At the moment we, who called this meeting, do not know how to pick the points of entry--opportunistic themes for constructing projects. We don't have any ideas about what kinds of things ought to be evaluated that would be meaningful to the line Navy. We pretty well know we don't want to do more surveys or special studies. The question is: how can the way the Navy regularly views itself be used to affect change? What kinds of observations would be most useful to line commanders and at the same time, instructive to designers of interventions and improvements.

Performance rather than procedural evaluations can spur improvements--but what do we expect from ship environments.

There are probably analogs in the urban environment. For example, in environmental studies of crime and crime prevention in urban areas it was shown that there are early signs of trouble that become evident before crime breaks out in an area. These signs include more trash on the streets, more people hanging around and so forth. On the ship it would be useful to find out in specific detail what officers and chiefs use to "diagnose" how the ship is functioning. They probably watch a lot of things intuitively in order to keep tabs on what is happening and to intervene. But if they're like business managers and elementary teachers, they will have trouble explaining how it is they know what they know.

## What's Worth Doing

There are a wide variety of opportunity-sensitive projects to improve ship environments that might be conjured-up. Each would have some relation to raising the mission effectiveness of the Navy. One technique that might be used to access the relative value of a wide variety of both project opportunities as well as development projects would be PATTERN (Planning According To The Evaluation of Relevance Numbers). Without a whole explanation of the methodology, it's a way of balloting among knowledgeable individuals about how well a thing is done now, how much better it might be done, and the likelihood for success of an improvement project. Individual items are evaluated within a hierarchical framework of relative importances for the various elements of such a large complex system like a ship's. This technique has been used to judge between major DoD projects, evaluate both private and public investment alternatives, and most similarly, evaluate alternative mine safety approaches and projects. The framework produced by this type of study is called a "relevance tree." It seems that constructing a relevance tree within which to judge opportunities for improving ship environments might be useful. The conferencing and balloting procedures used in the construction of such a relevance tree would at least provide a common base for the discussion of the various interests who claim competences to produce environmental improvements aboard ships.

### performance dimensions for judging organizational designs

- redundancy (dependability)
- flexibility (adaptive survival)
- stability in a context of change
- person-centered or task-defined
- heterogeneity
- distribution of authority and responsibility
- diverse communication pattern
- overlapping role; ways of securing status
- structural understandability and expectancy

## THE SEARCH FOR OPEN SPACE

In the fields of observation, chance  
favors only the prepared minds.

LOUIS PASTEUR

All institutions when investigated either by people from outside or by those who comprise the institution, seem complete and well-formed. Naturalistic investigation presupposes completeness. Once the institution exists, it's as if there was no room for negotiating anew any of the basic principals exhibited in its operation or rules of order. This is especially true in a long-lived, established organization like the Navy. With organization survival the fresh lesions of the past become traditions and soon part of the definition of the organization itself. For example, the manner in which the Navy conducts its personnel activities such as the assignment of personnel to roles on ships, appears to those who participate in the system as an external verity. These roles are virtually indistinguishable from the Navy itself. Yet, many Navy officers will recall that originally the Navy employed the "John Paul Jones" method of manning ships, namely, go out and hire a crew--even some "Shanghai-ing". The captain looks for a crew that he thinks can most adequately manage the tasks at hand. A good complement would include both swabs and highly reliable specialists. No doubt, such a captain would be realistic about the problems of availability and undesirability of a complement of overly qualified men.

Camels need openings to get their noses in.

As in most organizations, the allocation of Navy personnel tend to be viewed as if they were always the way they are. This basis framework for knowing persists even though it's known, if one asks specifically about the past, that the organization wasn't always at its current size and strength and that other rationals and task allocations were employed earlier. So, to adopt the "harking back to first principles" strategy, it might be possible to suggest that current practices are really heresies and that the "John Paul Jones"

method (hire-a-crew) is the true Navy Tradition. Without this, we continue to operate on the belief that the current system of practices is a complete, perfect, and nonnegotiable system.

There is no way for a tradition-based organization to decide which approach or system is best. This is because the one which is currently in operation is defined as that organization's way of doing things. When one tries to project onto such an organization, some alternative model it is seen as destroying the organization itself. Even Admiral Zumwalt's references to the revered exploits of longer haired and bewiskered sailors of the Navy's pasts did not completely change the minds of those who saw the new rules as the end of the Navy--usually adding "as we know it".

#### What Can Be Done

Ideal alternatives based on acceptance of another set of guiding principles, the process of organizational development might better begin with the simple search for "open space" within the structures of the existing organization. Viewed broadly and abstractly, the search for open space in an organization can occur both with respect to the physical environment (which in naval ships is tightly constrained and actively competed for by various functions) or in the managerial system (which aboard ships is also functionally constrained and procedurally determined). While it may seem like all space is accounted for within both the managerial structure and the physical setting, the discovery of even a ridiculously small amount of space in either of these organizational structures can create great flexibility. A tiny "free space" can act as a catalyst for improvements in the whole organization's effectiveness which one cannot be anticipated or predicted based on the size of the small starting place which one discovers. In fact, the tighter the system, the more effective the project to use well the open

Inventing categories may be another way to generate free space.

space that exist may be in achieving a rather wide-scale, significant, and dramatic long-range transformation in the organization.

Specifically, one could postulate the availability of a small "sanctuary" space aboard ship. This space would be used by the crew in both a scheduled fashion, for small group meetings and in an unscheduled fashion, just to be relieved of the embedded character of their daily routine. The availability of such a space may set in motion a chain reaction--relieving the use of hotel spaces for these functions, opening them up to other uses which could not previously be contemplated because of restrictions previously maintained on the need for privacy, and the social protocols that develop around the okayness of activities in common areas. The simple availability of a sanctuary space may make its use unnecessary, because it's there, if a man needs it, and that's all he needs. The activities of the new space in turn might lead to modified use of the work stations for informal social contacts. Perhaps comingling in hotel spaces in a manner previously not contemplated or possible might occur among parts of the crew (e. g. , deck and engine), because of the broader opportunity for contacts.

Many corporations and schools have used this principal of the definition of discovered space to open up new possibilities for reorganization and reorientation within larger parts of the organization. Such projects have been handled in a safe, orderly, spontaneously generative fashion.

Again, in urban planning projects, a small budget item of, say, \$10,000 in a \$10 million program budget which set aside for the participative planning of a special feature of the project, say a thematic fountain, may have a tremendous impact on the way in which the project unfolds. Similarly, a small amount of monetary set-asides in any organization can lead to the engendering of group processes

*Progressive Architecture* devoted a whole issue last year to designs for "found space".



to undertake these now apparently important and free negotiations for resources which otherwise would not emerge out of the tightly prescribed social and vocational activities of organizational life. This approach to discovery through negotiation is particularly applicable to the shipboard setting.

Two principles emerged out of these preliminary discussions. One, the identification of "organizational units" as a key to identifying those areas of everyday life in which attitudes get silently and inconspicuously formed concerning the potential and the aspirations of men on board; and two, the concept of searching for or creating "open space" as a means of identifying opportunities for renegotiation of normal in:

- (1) The settings and equipment that make up the physical context of the ship;
- (2) The features of the organizational and managerial environment.

Renegotiating relationships within the system using small "open spaces" can induce a safe and well-managed transition through a sequence of events leading to minor but significant modifications in each of a number of other aspects of the social and physical environment of the ship.

Efforts to induce bottom up changes have less chance of going awry than attempts to introduce top down changes.

In point of fact, this method is less perturbing and more conservative than the traditional, high-level policy pronouncement attempts to liberalize life aboard Navy vessels. By contrast, for example, relaxation of dress codes, communications protocols, and social regulations by their very nature produce a high degree of ambiguity and confusion on the part of men trying to discover how to conduct themselves aboard ship. The negotiation of open space focuses on creative response to new issues not changing old procedures.

Rand: Inventing and defining open space is the first step in what we term a "process design." This approach starts with very small, critical areas of a ship's physical arrangements and management structures and proceeds step by step to realize the potential of the cumulative effects of successive modification in a long-term, highly managed fashion.

### The Classroom Change Example

Suppose you had some typical classrooms and you wanted to make some material change in them to improve their functioning. One thing you might do is to take a minimal area like four square feet and carpet it. By doing this, you define the carpeted area as a new place. Next each group can negotiate what the new place is for and what it means. For example, they might decide that it should be a place to confess when someone had done some wrong without any retribution. Or they might decide it should be a place to go when one wanted to know an answer during the test and someone could come and whisper it there, but both would have to whisper in full view of all the others in the room.

A class could come to define this carpet in many different ways. They now have made a material change in the environment. It's real, it's apparent; and it has a lot of functions loaded up on it. And, best of all, it costs very little money.

Scheele: I think there is a lot of potential in selecting some small things to do which are evident to everyone and whose meaning can be negotiated. The protocols for some piece of carpet are entirely up to, let's say, the teacher in the classroom to invent, or the captain of a ship. If this happened, then suddenly, others find they know where there is this tiny unassigned portion of the ship or some other

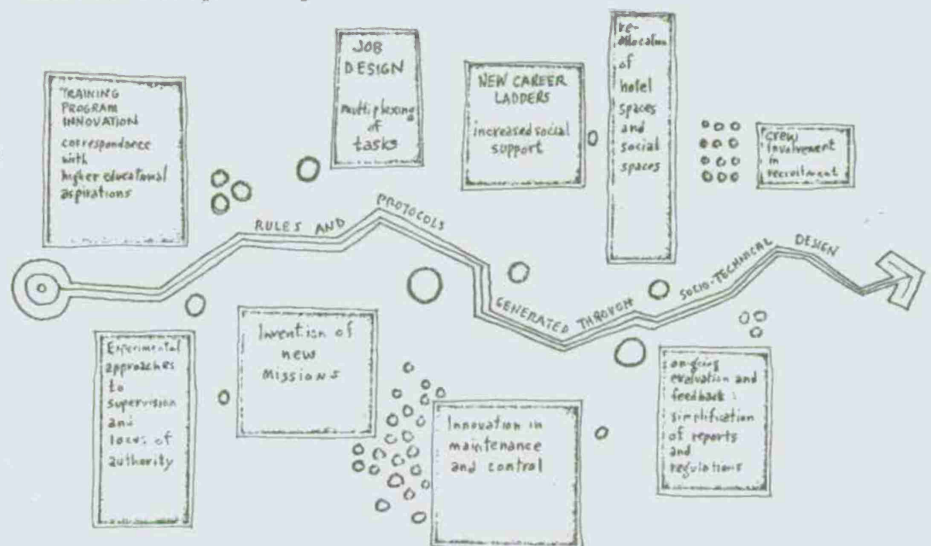
It doesn't take much to get started, it's the meaning you give to the effort that counts.

What something might come to mean is not always different.

thing which can be defined through negotiation and experimental use. If we define this process as a project and put someone in charge of the project--explaining it to the captain, and so forth--then things might begin to happen. Once a couple of things have been worked out, other larger changes will be possible to contemplate. Command will see that their prerogatives are not lost and that improvements may be possible."

None of these dynamics happen when an improvement is first "researched", then completed specified, and sent out for implementation. We heard such things get on the bottom of priority lists. Beginning with the absurd, everyone knows that everyone on a ship needs faith so possibly the electronics people compete with the psychicphenomona study group and the chaplain as to how a tiny space will be used. If similar tiny spaces are negotiated and allocated separately on four ships, then we have a cross comparison to learn from. Possibly, we might even take ships through some "warm-up" exercises, where effectiveness will somehow be subjectively looked at. In any case, clearly one kind of environmental management project with good prospects to discover or create "open spaces" and then to negotiate its function and meaning among several groups and load it up with protocols.

# INTERACTIVE CONSTRUCTION OF SOCIAL "NORMAL" FORMS



## THE VICIOUS CYCLE OF ORGANIZATIONS

We think so because other people all think so; or because — after all, we do think so; or because we were told so, and think we must think so; or because we once thought so; or because, having thought so, we think we will think so.

Henry Sidgwick

In point of fact, we began to identify something about the character of all organizations--a potential line of development, or, more frequently, an occasion for regressive development. This cascade of events, or syndrome, occurs as a result of common decisions about organizational structure, size, complexity, and management. In general, the Navy cannot afford to evolve its mission effectiveness like large business organizations, but must stand ready to perform its assigned functions, accepting them as fixed, unnegotiable, and absolute. This means that when the supply of new Navy men becomes restricted and indeterminate, there is a tendency to organize work and the tasks required at their lowest, most specific, most concrete level of performance. This is intended to insure that, no matter what contingencies occur, the necessary tasks will be able to be performed whether or not the technical skill and social competence for more integrative job performance is available. In other words, the Navy isn't prepared to depend on the availability of highly adaptable people with diverse skills and backgrounds. Rather, as the Navy sees it, it must define its basic organizational structure so as to create positions for the performance of highly specific and very narrowly defined tasks.

The Navy is counted on to do certain things, whether it would rather to or not.

This, of course, is only one side of the picture. On the other hand, the Navy encourages its personnel to think of their careers in the most diverse, self-propelling fashion. It is important, however, to address the implication of narrow task definitions on a cycle of organizational development. A cycle we believe may have widespread negative

consequences. This "vicious cycle" of organizational life begins with narrow task definitions. Caveat: "specificity of job definition is understood to be only one structural dimension of an organization. We don't want to suggest that this dimension is a complete description of any existing organization."

To continue, where tasks are defined narrowly and prescriptively based, e. g. on mission requirements; the organization tends to develop rather rigid career lines for all but the few exceptional participants who garner side experiences on the job and manage to project and win approval for highly individualistic plans for stepping up the career ladder. Most career development opportunities for enlisted personnel in the Navy are restricted to work done in Class A schools. Even these tasks, though they have carry-over potential for careers in beyond military life, are confined to learning a broadly defined area of technical competence. Little, if any attention is directed or assistance given in helping new men construct a diverse future plan for using the Navy as a life context. The tendency is to reduce the importance of on-the-job learning and informal learning. The prevailing organizational style is not to actively support men in their attempts to sample diverse career possibilities and build up several options. This leads individual men to expect and insist upon external planning and control.

Tell me what I'm supposed to do.

From the point of view of management in such organizations, it appears that people are incapable of pacing their own work and postulating their own performance standards and rewards. A good part of this phenomenon can be seen to be self-fulfilling prophesy. In turn, unmotivated under-



accomplishment justifies increased centralization of management. Tighter general rules become less applicable to any particular situation. Since there are no peer groups or small voluntary associations to take over the role of managing the allocation of work and sustaining of morale at the lower levels, rules are either slavishly followed with lower effectiveness or ignored leading to unresponsiveness and lower productivity. Once management in an organization becomes centralized and reliant on uniform, system-wide, evaluation criteria, performance motivations and the judgments used in awarding them usually become restricted to a narrow band of possible rewards, namely, financial return or simple positive reinforcement.

You can't even do what you're told.

This narrow range of motivators, in turn, leads to increasing turnover of manpower and a failure to attract a diverse group of new workers having surplus skills which are the flexibility resource of the organization. Faced with a constant turnover of men, management tends to accept this pattern as inevitable. "There are just no good men left" is frequently heard in such organizations. The management attitude capacities and the spontaneous group loyalties these support which are the very bedrock of maintaining a high level of trust among members.

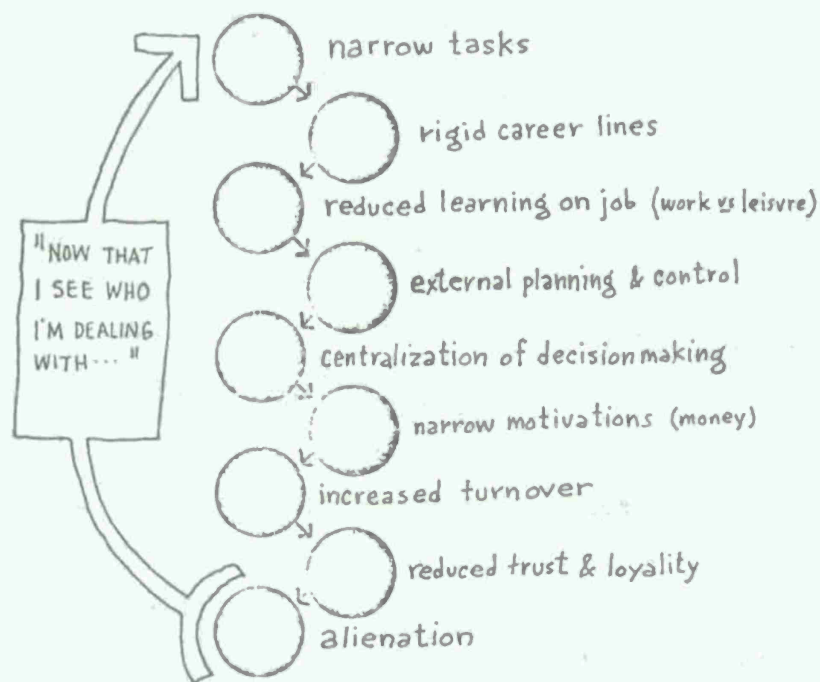
Finally, inability of management to make decisions which recognize and utilize the hard-won loyalties that emerge within small groups, leads people to have a profound sense of alienation. Management then looks at these alienated people who evidence a lack of trust in one another and question their own capacities, and finds them in need of further control and coercion. Such workers are likely to be anxious to get out of the organization as quickly

To management pessimism sells better than optimism.

as they can, many even if they don't have a real alternative. They resist and are expensive to motivate with the very narrow spectrum of incentives available--consisting largely of bureaucratic forms of reinforcement. Incentives, bureaucratically administered, quickly become obligations. Workers display a lack of ability to take responsibility for making job decisions that involve good judgement or social choices that appear to be in the interest of the whole group. Such organizational experience produces members who appear to have little interest in propelling themselves through an open-ended, diverse, achieving career with the organization.

Management tends to make decisions about the future based on their present perceptions of the competence of the men with whom they deal. Managers often fail to see that there may be something about organizational life in "the system" which leads to this profound sense of alienation. But nonetheless these same managers seldom fail to note the quality of alienation which is symptomatic of the men with whom they work. So, they assume alienation along with lack of motivation and responsiveness as a normal response. Given that "this is the kind of men we have to work with", task assignments must be still further narrowed, and more tightly specified. Career lines have to be further prescribed. Having "seen what happens" such managers have less faith that there can be any learning on the job. They put no trust in the potential of local self-direction nor even considering the possibility for reduced planning and control by external means. So it goes. The cycle begins again. Destined to repeat itself by virtue of the kinds of performances that it produces.

# Vicious Cycle in Organizations



This discussion may seem more apt for considering improved job design than for ship habitability. However, it is important to ask the question about the people for whom we are trying to create ship environments generating improved organizational effectiveness.

If we assume enlisted men will, like many officers, view naval service as a multi-dimensional life career, be it at a low or high level within the system, then we would interpret basic habitability requirements as including opportunities for informal learning, lasting associations, mutual concern over health and welfare, widely-based sources of motivation. This leads us to contemplate creating different kind of physical and social environment--perhaps not any more beautiful or asthetic, but certainly more holistic and diverse--than if we assumed enlisted men were merely serving time and escaping from the complexities of everyday life in the landbased world accepting for themselves the displeasures of a woefully alienated state for the term of their hitch. Environmental

Possibilities for personal development and growth may be a key feature of effective environments.

manipulation can then be seen as a valuable and low-cost tool for interrupting this process of regressive development which occurs in many organizations. Through the negotiation of environmental improvements it is possible to discover new potentials in people who comprise the Navy. Behavior brought into view by initial projects will have implications for the kind of habitat which would be appropriate to a new perception of what Navy people might be.

This is especially poignant in the case of the Navy. With many new personnel both officers and enlisted, one is dealing with essentially "preformed adults." In dealing with adolescents on the job, one's prophecy about what they might be--how their potential might unfold--determines to a large extent what in fact the situation and the environment produces. In some sense the Navy has an educational mission--that is to produce the most widely rounded training in practical skills. This would enable the Navy to produce people who are motivated to receive and come to merit increasingly complex and self-direct educational exposures, training experiences, mission roles, and environmental settings. In such situations individual personal aspirations and the good of the service are widely overlapping.

It is very difficult to determine what signs to look for in order to know the ways in which the vicious cycle of organizational decline might be affecting a given situation. There are no guides as yet to help an officer or a chief reevaluate his perceptions of the aspirations and qualities of his men free of the ways in which these qualities may be shaped by organizational features which are not apparent. The best hint that we have identified to date on how to look at these organizational features or "organizational items" is drawn from the studies and investigations performed by \_\_\_\_\_ and his colleagues in the field of ethnomethodology. Through the careful and critical

examination of everyday behavior aboard a ship (assignment of work, accomplishment of routine maintenance operations, the process of acquainting men with the character and operation of the ship, the informal activities that occur during off-duty time), one might begin to identify those critical, behavior-shaping agreements about the meaning of the ship environment. The circumstances and situations created by these tacit environmental agreements may not be evident from a review of the command structure or the organizational plan for the operation of the ship which produces the assumptions that the on-site managers, (chiefs, division chiefs, division officers), have of their men and their potential.

Once a series of these organizational items have been drawn from studies of everyday life aboard ship, it would be possible to begin to cut through the cycle of regressive development. Further, it should be possible to discover new aspects of the men and their aspirations which may previously have been hidden from command's view due to critical assumptions buried in the organizational plan which were not previously visible or known to the managers that are effectuating the plan.

For example, Schwartz has shown that it is possible to legitimize previously "lower caste" work that needs to be done in regular ship maintenance by turning it into a relatively complex technical task with complex opportunities for self-management of the activities by the people who perform the work. In other cases it would be possible to arrange work assignments so that no person does only maintenance activities or conversely that all people participate in some form of maintenance planning and control (the Commander Fox experience). This approach is in contrast to dividing ship maintenance units into toothbrush-

Why do we have to wait for crises to let people exhibit their abilities to come through with whatever's needed?



size strokes of the deck or thumb-nail scrapings of the hull, and allocating these meaningless, rotely-defined units of work among arbitrarily classified crew groups.

The Navy has to accept a certain amount of "bitching" as part of its organization milieu. Nobody genuinely likes to do maintenance work. Possibly everyone should have the experience of doing the most menial tasks aboard ship as part of the understanding of the ship as a banal, fragile, working environment and not a pleasure cruise. It is however, important to see that the men performing these tasks as part of their recognition of the multi-dimensionality of the ship as a system, develop a genuine commitment to this kind of work in an interdependent, and not an alienated, way. Each crew member can, like a homeowner, come to recognize his legitimate responsibility, not just for the beautiful decoration of the living room but the operations of the sump pump and cleaning the cess pool as part of the biological cycle of life. Fostering cross-level, multi-dimensional interdependencies and explicit recognition of a wide range of individual competences can create better-maintained and more suitable environments to reverse cyclical debilitation in organizations.

Creative bitching.

## PROCESS DESIGN vs. DESIGN-BY-OBJECTIVES

There are not many people who would care to sleep in a church. I don't mean at sermon-time in warm weather (when the thing has actually been done, once or twice) but in the night, and alone.

Charles Dickens

It is important to specify some of the differences between the programmatic, linear approach to design traditional to the engineering of naval ship environments and a multi-option, process-oriented design approach. To summarize, design-by-objectives presumes to understand at the outset the appropriate categories of analysis. Namely, traditional design proceeds as if adjustments in environmental quality can be made according to ergonomic criteria--improvements in such things as room size and arrangement, perceptual order and complexity--and that improvements in these will improve conditions aboard ship. On the other hand, process design begins with the examination of everyday activities and the opportunities for intervention that improved performance of these activities suggest. The process design approach does not proceed from abstract objectives drawn from an ideal realm, but begins with concrete implementation possibilities which exist in latent form within the system.

Clearly, there are important ways in which the ship environments can be improved through the kinds of projects suggested by prescriptive criteria such as reducing noise transmissions, adjusting lighting level . . . But, by their very nature, ship environments violate many of the principles of habitability which would be suggested under more ordinary living or working conditions--such as those of school room design. Ships have their own normal. The issue, then, is that the application of uniform habitability criteria developed in some abstract sense (what people need) or for some other normal situation (OSHA standards for workplace safety) are not

Life at sea should be more than a less nice version of land life with fewer places to go and women.

specifically relevant to ships. Abstract standards could be negotiated for ships, but application would be somewhat arbitrary to any particular ship and will likely meet with resistance through active complacency. Good general designs are seldom particularly very good. Instead, the process design approach begins with investigating the structure and form of everyday reality aboard ship in order to identify those situations which have either disproportionate negative impacts on many lives or where new protocols might be introduced that would alter significant behaviors. Context-specific designs can then be iteratively worked on for those settings.

### Design-By-Objectives

In the traditional approach to design, the following methodology unfolds as a seemingly inevitable organization of planning activities. Each different professional speciality has developed its own terminology and problem definitions geared to secure a clear conception of their respective responsibilities and seeing to improve shipboard environments. But, the separate and joint designs effort of these specialists have developed a tradition. This tradition goes something like:

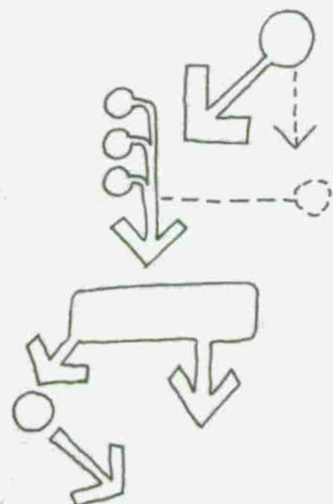
- First: Specify goals and objectives for habitability. Traditional design methods specify goals as if they can be known in advance based on universal assessments of human needs. A data base for these posited objectives has usually been assembled from data collected in a wide variety of circumstances and not developed in response to a particular feature, institution, culture, or situation.
- Second: Identify constraints and items. Once ideal objectives have been laid out, the traditional design project calls from those involved lists of all their program requirements along with any special, economic, and social

constraints which have to be taken into account by the design for achieving the objectives.

- Third: Formulate individual subprojects or design tasks according to traditional role descriptions. Linear project management models attempt to lay out relationships between the various work tasks in elaborating the design project. These task structures, respect, and derive their form from, the traditional divisions for fields of specialization--engineering, architecture, social science, economics, and so forth.
- Fourth: Prepare framework for integration of the results of each proposed task into a final design and develop a management system. The traditional design project then proceeds according to these role prescriptions which are usually defined almost entirely outside the particular instance involved. This procedure involves a silent theory as to how environmental modifications take place. The experts look at the scene and then go away and prepare individual design recommendations. The design arrived at in this fashion reflects more the distinctions between the professional contributors and the manner in which work was divided than any properties of the situation being designed for. While this may seem the logical way to divide work, it is not necessarily suggested by or congruent with the requirements of the situation. In fact, more often a great deal more work is contemplated than might actually be needed to correct the deficiencies of the situation. But, this redundant work is undertaken to fill out the complement of professional claims on expertise.

Fifth: Execute the project in a linear fashion. Since the ideal project plan has been laid out in a step-wise linear fashion, (even if it includes 50 feedback loops), the work itself proceeds in linear sequence from conceptual design, to engineering, to conception of the respective roles of distributors, suppliers, to producers and manufacturers, to constructors and assemblers . . .

This model of the design and implementation process is appropriate for the development of well understood systems functioning in stable environments. That is, in situations where programmatic requirements are not likely to change appreciably between the time of conception and the time of completion of the designed product or environment. The very nature of the question of habitability, however, suggests that the claims made of the shipboard environment are always changing in response to the social context. This is equally true whether the Navy is operating as a peace-time force or in a state of active deployment.



#### Process Design

The fundamental quality of process design is the specification of design features based on initial actions taken in specific settings related to, if not the actual, target setting. In this sense, it is analogous to research-in-action where a lore about what might work is accumulated in the process of trying to do something responsive. Parallel, often not directly related, efforts to improve shipboard situations are likely to prove important in discovering which goals and objectives are really worth a significant design effort. Such attempts at meaningful action act as probes to reveal the qualities of the decision structure, what are current and compelling justifications, and



what kind of information one has to amass to support evaluation of design results. A process design project might proceed something like:

First: Identify a direction for development. Instead of articulating specific goals and objectives for the outcome of the design, the process-design approach merely articulates a direction for growth of the concept. Starts can be made virtually anywhere within the system. This implies an open systems approach, since in the design process is a part of the operating system and not a part of the special province of the professional specialist. Design initiatives, effected in real time, frequently reveal important factors as the process unfolds which couldn't be anticipated. New factual information and design hypotheses are produced based on observation of ongoing interaction. Sometimes this interaction is provided by orienting the design process to the concrete need to remedy or upgrade existing situations--such as in the process of rehabilitating existing ships. In design situations where existing ships are not available, various forms of simulation can be used to provide concrete settings for refinement and elaboration of the initial design direction established. This new context-specific data is then used to draft a second, third, or fourth design statement that elaborates and differentiates a highly specific growth.

Second: Search for free or open space. In contrast to lists of constraints which limit the creation of an ideal environment, the process design approach attempts to look at constraints as opportunities for possible design interventions. The search looks behind,

# THORSRUD'S LIST

- o gradual self-recruitment
- o self-determined relation of leave
- o step-wise training to integrate deck and engine crews
- o changes in physical layout (dayroom, offices, mess,...)
- o integration of ship management
- o reduction of reports and regulations
- o deck-engine integration
- o integrated budgeting and planning
- o plenary ship's meetings
- o rationalization of painting and cleaning
- o fixed overtime compensation
- o restructuring status system
- o step-wise evaluation (from lowest to highest echelon)
- o step-wise reallocation (from lowest to highest echelon)
- o modification of work culture

around, over . . . accepted limitations to discover where significant modifications might possibly be made to a system. This search is made knowing that in almost every system at any moment, every part or feature that one can think of to look into appears to be complete, necessary. In organizations all systems tend to look as if they are whole and well--formed. But as Inar Thorsrud has suggested "There is more space between the forbidden and the prescribed than one thinks". The discovery of a small opening within a system can lead to radical albeit safe modifications of the system as a whole. A chain reaction of possibilities and improvements can be set in motion with one successful small modification. The process design approach suggests that these starting points of inquiry into the nature of the system and its possibilities for change be done in a redundant fashion. This means seizing upon several starting points in parallel. Suspending judgment long enough to acquire fresh, context-specific data whereby to eventually select those points of entry into the system which promise to produce the most catalytic and self-propelled set of consequences.

Third: Experiment with alternative designs. The quantitatively and qualitative better results expected from the process design approach are dependent upon the design alternatives generated in response to constraints. Rather than its virtues being dependent upon the completeness with which the analysis of goals and constraints is done as in the design-by-objectives method, the process design approach hinges upon the participative invention of design alternatives which have the effect of opening up a system which seems complete, over-determined, and inhospitable to major modifi-



Fifth: Undertake ongoing operational assessments. An important part of the process design approach is to structure means for obtaining feedback and evaluation as an aid to the ongoing process of implementation. This means that the data needs and framework of information of requirements have to be sensitive both to the timing of the implementation process and the level of certainty which is relevant given the character of the situation in which design improvements are being introduced. Considered in this fashion, data requirements become part of a process of cyclical design development. Several parallel unearthings of a variety of issues are made. Several possible design alternatives are formulated leaving the execution to the localizing initiated actions. Through these actions, discovery is made of still further issues for inquiry and the suggest of design alternatives. Assessment, then, takes the form both of evaluating the effectiveness of particular design alternatives and diagnosing further opportunities for introducing effectiveness-improving modifications.

Sixth: Explore the context and extend process design through generalization and abstraction. The process design approach attracts to specific incidences of success the interest and larger involvement of key personnel in the decision making structure of and organization or institution--in this instance the Navy. As process design cycles are iterated in the discovery of local solutions, abstractions of actions indicative of more general principles or more generalized application are produced. This can be expected to attract top staff and command interest also. Unlike normative parametric studies which might employ 20 or 30 ships in the fleet in order to isolate a single problem, the process design approach would begin



If we, the locals, feel we did it once, then we can do it again and will be looking for the opportunity.

with a small number of ships, even a single ship.

To illustrate, feasible approaches to local problems are identified, these candidate solutions are next tested and then revised with local participation in second or third iterations leading to a locally precipitated sense of power and competence. The new-found feeling of effectiveness is instrumental in the discovery of still other opportunities for change which can be designed and tested locally on a voluntary basis in a small numbers of additional cases. As each of these trail blocks are undertaken, a policy liaison function of the process-design team is established to utilize the introduction of these local solutions as demonstration projects, with their effectiveness observed by other commanders and decision-makers in the fleet.

Rather than demonstrating a predetermined pattern or design concept which would be useful as is on all or similar ships, the purpose of these liaison communications would be to limn and explicate the reasoning behind the process design projects. A range of feasible solutions to a series of local problems are illustrated, thereby encouraging the application of the process design approach to a wider range of opportunities; not the transfer of specific solutions. The more people that observe process design, and note its manageability on a small scale, the greater the likelihood of willing adoption of the framework.

As the body of "for instances" increases in size, one can begin to generalize from the experience. Both long-range policy implications for change procedures and specific variables for parametric research can be derived from the process design action projects.

These variables are likely to be much more useful than those of the type stated in advance on the basis of arbitrary categories of analysis.

#### A Proto Example of Process Design

Schwartz: "I have a specific focus: to invent and demonstrate concepts for reducing manpower in the facilities maintenance area. I have taken a three pronged approach. In facilities maintenance, this includes waxing, chipping, scraping, peeling, all of the house-keeping tasks, and painting. These activities result in tremendous costs to the Navy in personnel and extreme degradation to the hull systems because of corrosion. Currently, a lot of people aboard ship are directing and doing facilities maintenance who cannot recognize red lead from rust.

The three prongs of my approach are:

- (1) Consolidate rather than diversify the tasks that are being performed onboard ships in this area by creating a team of specialists, and assigning them responsibilities and give them the appropriate training;
- (2) Give them better materials and better equipment to do their job;
- (3) Design the environment so it doesn't require as much manpower and money to maintain.

Using these three concepts, I have organized an experiment. Buying vacuum cleaners, carpeting, new paint systems for a ship to be deployed in August or September. Measuring changes in motivation and morale, using "climate" questionnaires and predicting these will improve; getting the job done in fewer man-hours. On a destroyer today in excess of 1400 hours is spent every week in maintenance-related activities--27 man weeks. If we did away with some of the vinyl-asbestos tile, we could do away with some of the very expensive "stripping" functions that go on. Reorganize the deck division to include 15 specialists on the experimental ship--DE1052 Class. I believe this will demonstrate that the facilities maintenance work-load can be cut roughly in half.

Garfinkel: "Structure the inquiry such that organizational items can be identified to see what alternatives can be suggested--is there a set of other tasks that are similarly non-negotiable? Maybe they'd be in areas such

as communications, ship control, messing, preventive maintenance."

Schwartz: "There is another parallel experiment on the USS Blakely where the ship controlman concept is being investigated. Here, we are working with a retrofit and not new ship design. About a year and a half ago when the shipboard manning and automation project began, we set out to demonstrate that one could run a ships bridge with less than the current manning level. This was done on 17 ships in the fleet, a wide range of ships--the Forrestal I believe was one of them, some AO's and Destroyers, and DE's. The ships were told with the help of Admiral Z that they will reduce the number of men on the bridge. They were to do away with certain watches (e.g., the JL talker), and relegate personnel to other areas. The Destroyer Development Group in Newport helped in implementing the program. What we found in the simulation studies in mock up laboratories and on the 17 ships, was that one could reduce from 12 to 5, the people on the bridge. With the existing organizational structure on board the ship--they have a bosunsmate of the watch, a guy in the deck division who stands certain responsibilities on the bridge; the quartermaster of the watch, a helmsman who usually comes from the deck division--they come from many parts of the ship, and their watch standing responsibilities are a drag for them. They receive on-the-job training, but that is not why they joined the Navy. As a result there are many functions which are not being performed or are being performed in inferior ways. The concept is let's have a specialist team on the bridge, where they rotate their functions. This is job specialization and job enlargement."

There are possibly multi-specialty specialties--leading to the questions: Can each individual in the Navy have a unique set of competences and what are the mutually reinforcing competences that make individuals able to contribute most.

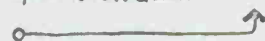
## PROCESS - DESIGN

### TRADITIONAL DESIGN

- basic ideas & concepts
- specification of objectives
- programming  
with restrictions
- execution according to  
role-prescriptions
- integration of programs
- final solution

### PROCESS DESIGN

- establish direction for growth
- search for free & open space
- experiment with alternative  
social and technical designs
- formulation of an appropriate  
design process
- cyclic evaluation



## RESEARCH-IN-ACTION MODEL

There are concrete implications for adoption of a research-in-action model for experiment design and data collection in the light of the very important findings produced by the Navy Neuropsychiatric Research's Center's Fleet Problems Branch. Lt. Dean conveyed the fact that their studies demonstrated that the single best predictor of psychiatric stress and instances of breakdown among men in the Navy was the name of the ship. The particular ship on which they were stationed was the most powerful--not the ship type, size, location, mission or any other descriptive variable. This finding suggests that it is in the individual ship where one can, upon careful exploration and analysis, identify both threats to psychiatric survival and parallel opportunities for optimizing conditions for shipboard life. The research-in-action approach was conceived to begin with the idiosyncratic circumstances of the local situation in a particular instance. The research-in-action approach is less concerned with being right in some ultimate sense, than with improving the immediate knowledge base. The means and methods of evaluation are also a part of the research process. The categories for information and the kinds of measures that might be relevant are the subject of any study as well as the way in which its results are framed. For example, a communication system aboard ship (social communication) maybe combined with the normal means of obtaining feedback from men about their on-going problems in living and working aboard ship to provide research data. The research-in-action approach represents a new attitude toward data collection. Data is collected in the interest

Tsze-Kung' asked what constituted a superior man. The Master said, "He acts before he speaks, and afterwards speaks according to his actions."

Confucius

What ever is, is the case.  
WITTGENSTEN

# DATA COLLECTION APPROACHES

## SURVEYS

QUESTIONNAIRE

This is not a test

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## ERGONOMIC INDEXES

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var c03								
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var c04								
From To	1	2	3	4	5	6	7	8
var c05								
From To	1	2	3	4	5	6	7	8

## RESEARCH-IN-ACTION

## REDUCTION OF DESIGN AND EVALUATION DATA REQUIREMENTS

- Data acquisition as a by-product of various meaningful activities
- Subordination of data needs to decisionmaking framework

- step wise data collection and on-going (institutionalized) evaluation

- Operational guidance to experimental innovations vs "unsituated", pure science

- Built-in participation of crew in research and evaluation vs "gondocking" approach to introduction of innovations.



of operational guidance. Its collection is as much as possible inobtrusive, and the byproduct of otherwise useful and significant activities as part of ongoing evaluations of performance of a system. It is intended for immediate management attention and not just to establish some research premise. Having the question of what data to collect explicitly a part of a study design is also helpful since one can't predict in advance the nature of the data which will be needed. The subordination of the data collection function to judgements of relevance to the organizations decision-making framework leads to high effectiveness in producing results which will be seen as useful.

The impetus for the research-in-action model is provided by parallel efforts in several fields. This mode of research reflects increasing concern by sponsoring organization with the application of social science knowledge to the affairs of life. Also, researcher's exhibit a growing interest in allowing social science data and theory to be shaped by the problem context as it appears in live, responsive institutions.

An ongoing means of data collection with a similitude to ordinary activities aboard ship would provide a function for data collection. Some data collection could serve the attested to positive value of "bitching" where opinions would be poled on a regular basis through some mechanism akin to a lottery, a Gallup poll, a numbers system, or some other familiar rating method.

#### Parallel Parametric Analyses

At the same time that process research data are being collected, it is important to build a theory of habitability which would characterize and confirm the effectiveness of the psychological variables affected and influenced by these

interventions. This is important for two reasons:

- (1) To provide evidence why these innovations should be contemplated for fleet-wide application, and;
- (2) To demonstrate the inherent economy and savings of process design options--that is, that they pay for themselves because of their immediate concern with social order and instrumental effectiveness and avoid high-priced decorative improvements.

Therefore, it is important to engage in parametric studies with a thorough-going analysis of both the set of physical design variables which are important to distinguish in shipboard environments and those social measures related to personalities, small group behavior, organizational climate, alienation, personnel productivity, and so forth, which would illuminate potentially rich sources of effectiveness for environmental design modifications. Environmental improvements need to be judged against a list of objective dependent variables (such as increased reliability, decreased maintenance costs, lower vandalism, high performance characteristics on measures of mission preparedness, lower costs for equipment upkeep). It is important to continue development of such measures of performance and theories of their relationships.

If coniving and risk would go on in the name of effectiveness instead of counter-objectives the goals of the source and the individual men would likely be better serviced.

#### The Search for Organizational Relevance

There are many and varied pressures affecting all institutions in our society due to the force of social change. The occurrences which occasion expected changes in many institutions include: a generally higher level of education widely available to young people prior to their entry into industrial or military life; increased reliance on automation and technological systems which require more educated,

highly skilled personnel; an increasingly rapid rate of obsolescence for technological and related weaponry systems requiring the flexible use of technical skills and constant retraining as part of their operation and more frequent requirement for adaptive management skills to deal with unanticipated situations and events by ship commanders, division chiefs, and other line officers.

These occurrences on top of the general revolution in individual expectations concerning one's life, indicate that to meet the challenges of the next ten or fifteen years, the Navy will have to contemplate fairly seriously the redesign of its ships. Such redesign programs might involve:

- (1) A decrease in crew size;
- (2) A reduction in the amount and type of unskilled and semiskilled work;
- (3) Participation in policy--making;
- (4) Possible new role structures as part of the ships social system;
- (5) Inclusion of non-defense missions.

Another reason for engaging in research-in-action studies is that the "market" for Navy recruitment, like the recruitment market for many institutions in society such as colleges, marriage, and retail sales employment, is becoming severely restricted as emphasis remains on the 18 to 21 year-old. First, there are less of them. Second, there are more options for young people and more awareness of the options.

Mid-career crisis now affecting the 40 year olds in our society could be a boon to the Navy.

Clearly the Navy has recognized this in their lateral-in lateral-out program. But, the more older personnel are sought for their technical skills or their managerial competence, the more the existing Navy way of doing things will have to provide support for the development of new

protocols and new role relationships among views.

Improved personnel utilization means guaranteeing continuous learning on and off the job, increasing participation in decision-making by every level, enhancing the availability of social support on the job, and establishing clear and meaningful relationships between current assignments and future plans, both in and outside the Navy. In all of these changes, there is a common thread--greater diversity and individual competence held together by a multiply-bonded organization fostering greater interdependence.

In beginning to construct what the new Navy ship might be, it is important to not treat this as a problem for commonplace fantasy. A better start is recognition of the current Navy as a highly effective, established, high-performance, well functioning system. From this beginning, then chart directions of growth which may lead to a patterned and safe process of change, culminating in the new systems which will be needed in order to meet the needs of the next generation of sailors. The Navy's organizational activities which might make good starting places for research-in-action projects include the following:

- (1) Assignment of Men to Leave - whether leaves are self-determined or come about through centralized management considerations;
- (2) Reports and Regulations - the percentage of reports which seem to be redundant or from which little organizational learning takes place seems great and might be improved through technical augmentation of informal communication;
- (3) Time Budgeting of Annual, Monthly, Weekly and Daily Activities - how much of a role do personnel

A career is more than lots of activities strung together on a time line.

have in being able to conjecture about the system of organization for their time in order to serve their extra vocational interests most effectively when operating on peacetime missions;

- (4) Ship Maintenance - investigating painting and cleaning to see if they could be better rationalized and handled in terms of distribution of responsibility and if the highest degree of technology available is being considered. The same might be said for other routine and undesirable activities.

## Socio-Technical Systems

